

# Atlanta SPIN

Software & Systems Process Improvement Network

The Atlanta SPINnaker

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Dr Carlee A. Bishop

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

Ok, admit it – you’ve said it at LEAST once in your life!

Hey, this isn’t “Rocket Science!!!”

Well, for Dr. Carlee Bishop of GTRI, it really IS Rocket Science – and she brought along a “training satellite” to prove it.

In her information overload hour, Dr. Bishop brought home a point that can be used by every single one of us in our process improvement efforts: You don’t have to pick just one model for your entire solution. In fact, during her presentation she illustrated how GTRI has successfully “cherry picked” applicable pieces of several process improvement models to successfully deliver critical satellites into orbit.

Starting with CMMI, Carlee described how she and her team really liked the Requirements Development process

area because it was defined as a continuous process of feedback with the “Technical Solution” throughout the development cycle rather than an “event” at the beginning. Carlee pointed out how critical it was during complex systems design for the team to receive continuous feedback throughout the system development lifecycle. This resulted in both a superior end product as well as improving the knowledge base of the individual team members. This approach, also, lends itself to the real-world practice of developing components individually (which is a full development effort in its own right), and then subsequent development occurs in the product integration phase when the components are shaped to work together. She also liked CMMI’s

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### Next Meeting: June 17, 2009



## Quality Assurance in Offshore Development Model

Hank Rainwater & Noel Kierans

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

**“Systems Engineering for Space Systems Architecture Development” (Continued)**

*(Continued from page 1)*

premise that Validation and Verification occur throughout the life cycle. Some other models represent these important aspects as “happening near the end” – again, perhaps not ideal.

On the down side, CMMI represents the actual Technical Solution as a “black box” that just somehow happens. Yeah, like THAT’S all it takes...!

ISO 15288 diagrammatically displays a whole lot of “boxes.” How you put the boxes together seems to be up to user discretion – perhaps not ideal. However, IEEE does group the boxes in a logical manner and goes into some useful details in the model handbook.

The Systems Engineering DAU 2001 “V” model is particularly important for DoD contracts. The visual “V” diagram elegantly illustrates the relationships between the beginning and ending processes, and the feedback necessary for success. On the down side, this model does represent Verification and Validation happening “at the end,” even though these processes should in fact be occurring throughout the lifecycle.

The DAU 2001 Systems Engineering Process diagram is another elegant visualization of the lifecycle showing three interlocked iterative

feedback loops between the multiple functions occurring within the lifecycle. While not in and of itself providing a lot of details, it does help to understand the relationship between the “dance of processes.”

Next, Carlee discussed four decision making tool sets. The Quality Function Deployment (QFD) approach relates the “WHAT” from the customer to the “WHAT” that the engineers can provide, and relates primarily to Requirements Analysis; Qualitative and Quantitative selection methods relate best to System Analysis & Control; Morphological Analysis aligns with Functional Analysis and Allocation; and Modeling and Simulation are best suited to the final Design Synthesis. Say all of that 5 times real fast!

The remainder of the discussion involved examples of each of the decision making tools and hints on when best to employ them – these are all in the meeting slides available on the Atlanta SPIN web site and hopefully are self-explanatory. The grand finale of the night was a demonstration of her student-built “satellite” which hung from a string. A built in stabilizing device caused the satellite to always align to the brightest light – and the demo worked as designed.

What was the lesson here? Even Rocket Science needn’t be “Rocket Science” any more!

**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](mailto: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

*In our last article we covered some of the history of the CMMI prior to version 1.2. In this installment we will cover the current CMMI® models.*

In addition to the Capability Maturity Model® for Software (SW-CMM), source models for the CMMI® include the Systems Engineering Capability Model® (SECM) and the Integrated Product Development Capability Maturity Model® (IPD-CMM). Released in April 2006, the CMMI-DEV constellation is designed to help companies improve their processes for developing and maintaining products and services. This constellation includes 22 Process Areas: the 16 contained in the CMF plus 6 that are specific to product and service development and maintenance. These CMMI-DEV Process Areas are 1 Project Management Process Area (Supplier Agreement Management-SAM) at Maturity Level 2 and 5 Engineering Process Areas (Requirements Development-RD, Technical Solution-TS, Product Integration-PI, Verification-VER and Validation-VAL) at Maturity Level 3. One addition exists for CMMI-DEV; this addition covers Integrated Product and Process Development (IPPD). The IPPD addition includes practices and goals designed to facilitate timely and effective collaboration among the relevant parties in meeting customer and project objectives. Hence, the 2 models comprising the CMMI-DEV constellation are CMMI-DEV with IPPD and CMMI-DEV without IPPD.

In November 2007, SEI released the CMMI-ACQ constellation. Best practices contained within CMMI-ACQ focus on activities for initiating and managing the acquisition of products and services. In addition to many other works, source material for the CMMI-ACQ includes CMMI-DEV and the Software Acquisition Capability Maturity Model® (SA-CMM). There is a common misconception that acquisition principles and practices apply only to government procurement. In fact, CMMI-ACQ was developed in close collaboration with commercial and IT organizations heavily involved in outsourcing engineering services and products. The Acquisition Process Areas build

on and expand the Supplier Agreement Management Process Area found in CMMI-DEV. These principles and practices, designed to ensure that only the most qualified and capable supplier or vendor is selected, are directly applicable to all on- or off-shore outsourcing arrangements. The Acquisition Process Areas, 3 at Maturity Level 2 and 3 at Maturity Level 3, are: Agreement Management (AM), Acquisition Requirements Development (ARD), Solicitation and Supplier Agreement Development (SSAD), Acquisition Technical Management (ATM), Acquisition Validation (AVAL), and Acquisition Verification (AVER). There are, including the CMF, 22 total Process Areas in this model.

The third constellation, CMMI-SVC, provides goals and practices for the service provider in developing, delivering and managing mature services meeting customer quality standards. CMMI-SVC, released in February 2009, draws from ITIL, CobiT, ISO/IEC-20000, and the Information Technology Services Capability Maturity Model (ITSCMM) and includes 24 Process Areas. In addition to the CMF, CMMI-SVC contains additional Process Areas covering service establishment, delivery and support. These additional Process Areas, 1 at Maturity Level 2 and 5 at Maturity Level 3, are: Service Delivery (SD), Capacity and Availability Management (CAM), Incident Resolution and Prevention (IRP), Service Continuity (SCON), Service System Transition (SST), and Strategic Service Management (SSM). Another new Process Area at Maturity Level 3, Service System Development (SSD), is an addition to CMMI-SVC. This allows for the use of CMMI-DEV, in lieu of SSD, for developing large, complex service engagements. However, unlike the IPPD addition to CMMI-DEV, the SSD addition to CMMI-SVC does not create 2 separate models; there is only one CMMI-SVC model which includes the SSD Process Area. There are minor changes in some of the other CMF process areas.

*In our final article in this series we will explore the two new models and the interrelationships among them as well as give some tips on applying these models in your business .*

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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/](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](http://www.sei.cmu.edu/membership) [customer-relationships@sei.cmu.edu](mailto:customer-relationships@sei.cmu.edu)

**About Atlanta SPIN, Incorporated**

[www.atlantaspin.org](http://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.