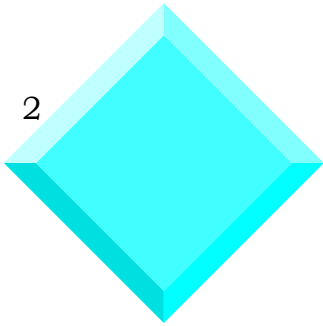


*SW-CMM or CMMI?
Do Nuances Exist
Beyond the Texts?*

National Defense Industrial Association &
Software Engineering Institute
4th Annual CMMI Technology Conference & User Group

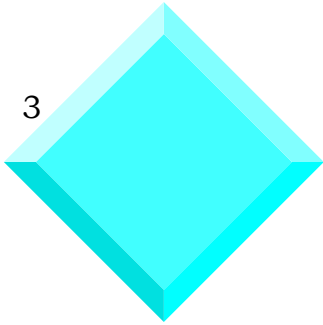
November 16, 2004
Jim Kirk

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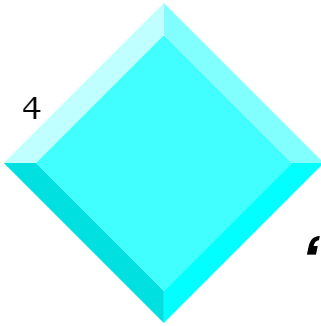
Acknowledgements

- ❖ **Stan Rifkin, Master Systems, Inc. Carlsbad, CA**
(www.master-systems.com)
- ❖ **Siemens Medical Solutions USA, Inc. (1999 - 2003) -**
for the opportunity to learn and use the CMMI in a
robust and challenging engineering environment
- ❖ **Presentation is a sampling, not an exhaustive analysis**
 - ◆ Generally, “stepping across the surface” of the models
 - ◆ CMMI SE/SW/IPPD V1.1 (Staged Representation)



Agenda

- ❖ ***Presentation Assertions***
- ❖ ***General differences experienced in implementation***
- ❖ ***KPA/PA Distinctions***
- ❖ ***Stakeholder reaction (during transition)***



Background

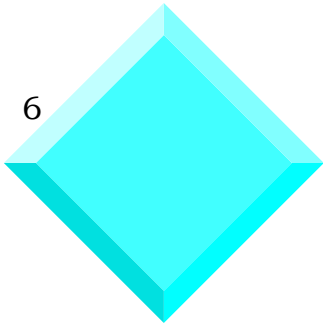
“You can see a lot by observing”...

Yogi Berra, New York Yankees, circa 1958

- ❖ **Siemens Medical Solutions USA Inc.
Angiography, Radiology, Division, Hoffman Estates, IL
(aka SMS-AX)**
 - ◆ **Jan 1998 - Jan 2001: SW CMM (Assessed L3 Dec. 1998)**
 - ◆ **Mar 2001 - Present: CMMI (Staged)**
 - ◆ **SCAMPI Appraisal June 2002 (L3)**
(Standard CMMI Appraisal Method for Process Improvement)
 - ◆ **Transition driven by need for systems view**
 - ◆ **Two very different design and deployment approaches
(SW-CMM and the CMMI)**
 - ◆ **SW-CMM: SQA and Software Mgr only**
 - ◆ **CMMI: “Process Champion” approach**

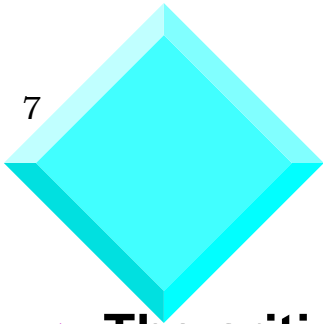
General Assertions

- ❖ **CMMI effort drives closer linkage to the organization's business model for success. (e.g., "Measurement and Analysis")**
- ❖ **CMMI helps reveal cross-organizational issues. It impacts all parts of the organization (marketing, finance, purchasing, other engineering)**
- ❖ **SCAMPI Appraisals were not as cleanly defined (at time of Appraisal) as CBA-IPI Assessments (i.e., the SCAMPI "scoring system")**
- ❖ **SW-CMM lacks focus on product deployment issues (e.g. "Product Integration" process area, SP 3.4-1)**
- ❖ **SW-CMM lacks focus on acquisition (vs CMMI "Supplier Agreement Management," SP 1.1-1 "Determine Acquisition Type")**
- ❖ **CMMI has stronger focus on process improvement ("Directing Implementation," GP 3.2)**



General Assertions (2)

- ❖ **CMMI affects organizational infrastructure (no longer some “black box” related to only software engineering folks)**
- ❖ **Organizational values, traditions, beliefs are challenged (e.g., in non-software areas)**
- ❖ **CMMI can be seen as intimidating and unnecessarily complex (e.g., if transitioning from the “familiar” SW-CMM)**
- ❖ **Management and leaders will be challenged to change (in addressing the CMMI Common Features)**
 - ◆ **“Directing Implementation” Common Feature - aimed at Generic Practices related to managing the process.**
 - ◆ **“Ability to Perform” - not new, but CMMI scope requires stronger focus across the organization**



General Assertions (3)

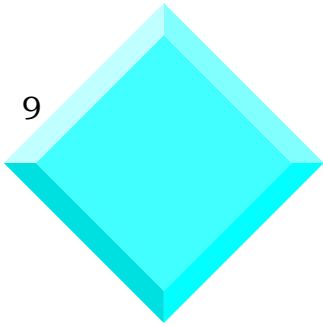
- ❖ **The critical (and underestimated) Common Feature “Ability to Perform” is same**
- ❖ **In most cases, the core requirements of the SW-CMM are “augmented” to make the concept more comprehensive and complete in the CMMI (e.g., Supplier Agreement Management)**
- ❖ **Custom Process Areas - Depending upon business needs, a customized process area may be required, such as information assurance or safety.**
- ❖ **Continuous Information-Sharing Improvement a “must” (e.g., intra-departmental)**
 - ◆ **SW-CMM (Intergroup Coordination) = other engineering areas**
 - ◆ **CMMI extends beyond engineering to “stakeholders” in business function areas (e.g., “Integrated Teaming”)**

Some General Differences: SW-CMM/CMMI (1)

❖ **Common Feature Nuances**

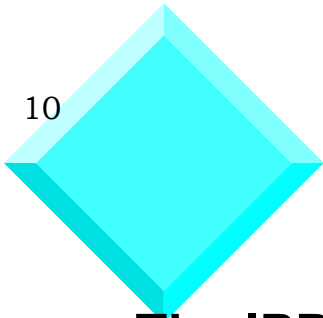
- ◆ Both sets (SW-CMM and CMMI) are enablers for Institutionalization, but...

- ◆ CMMI has “Directing Implementation” (DI) Common Feature (in Staged Representation)
 - ◆ DI requires a conscious process improvement effort (i.e. GP 3.2)
 - ◆ “Manage Configurations” (GP 2.6) Levels/types of CM formality introduced (ref SCAMPI at SMS-AX)
 - ◆ “Identify & Involve Relevant Stakeholders” (GP 2.7) This can be far-reaching in CMMI, e.g., into suppliers’ organizations



Some General Differences: SW-CMM/CMMI (2)

- ❖ **CMMI “Supplier Agreement Management” (SAM)**
Is not identical to SW-CMM KPA “Software Subcontractor Management”
- ❖ **CMMI “Decision Analysis & Resolution” (DAR)**
Provides structured decision-making process comparing alternatives against success criteria, selecting the best
- ❖ **CMMI encourages a link to the business model**
(e.g. “Balanced Scorecard” approach, e.g., MA process area)
- ❖ **NOTE: CMMI requires Root Cause analyses (GP 5.2)**
(brings benefits of defect prevention to L2, L3... BUT, only in the Continuous Representations)



Some General Differences: SW-CMM/CMMI (3)

- ❖ **The IPPD (Integrated Process & Product Development) extension**
 - ◆ L2 PA - “Integrated Teaming”
 - ◆ L3 PA - “Organizational Environment for Integration”

- ◆ **Focus on collaboration among functional areas/ disciplines throughout the product lifecycle (not only software)**

- ◆ **Vastly broadens blend of stakeholders**
 - ◆ Traditional players still exist (engineering, development, test ...)
 - ◆ Enhanced participation by non-traditional players: (mfg, marketing, finance, logistics, disposal, packaging ...)

- ◆ **May radically change way leaders think/work**

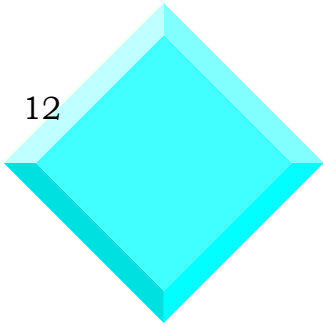
KPA/PA Distinctions (1)

❖ **L2 PA - “Supplier Agreement Management” (SAM)**

- ◆ **SP 1.1-1 “Determine Acquisition Types”**
 - ◆ **forces a tight linkage to the “Technical Solution” PA (SP 2.4-3 Perform Make, Buy, or Reuse Analysis)**
 - ◆ **e.g., Commercial Off-The-Shelf (COTS), Modified COTS, Government Furnished Equipment, In-house**

- ◆ **SP 2.3-1 “Accept the Acquired Product”**
 - ◆ **SW-CMM requires acceptance testing (Activity 12)**
 - ◆ **CMMI requires testing AND adherence to non-technical commitments:
(license, warranty, ownership, usage, support/maintenance.)**

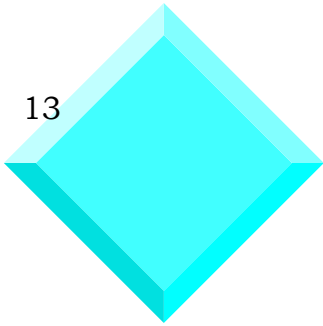
- ◆ **SP 2.4-1 “Transition Products”**
 - ◆ **linked to the “Product Integration” PA**
 - ◆ **ensure facilities & training to receive, store, use, maintain acquired product**



KPA/PA Distinctions (2)

- ◆ **“Measurement & Analysis”**
 - ◆ Is a Common Feature in SW-CMM
 - ◆ SW-CMM says “Measurements are made and used...”, vs CMMI’s dedicated Process Area

- ◆ **CMMI says:**
 - ◆ map to the “Goal, Question, Metric” paradigm (detailed trace of measures - base & derived)
 - ◆ data collection, storage, analysis, reporting required
 - ◆ measures also be used for process improvement
 - ◆ avoid inappropriate use of measures (e.g., personal attacks, out of context use, disclosure)



KPA/PA Distinctions (3)

- ❖ **“Decision Analysis & Resolution” (DAR)**
 - ◆ Which issues need a formal decision-making process?
 - ◆ Helps greatly in avoiding subjectivity of decisions
 - ◆ Strongly supports “Tech Solution” process area

- ❖ **“Requirements Management”**
 - ◆ CMMI requires vertical AND horizontal trace (SP1.4-2)

- ❖ **“Requirements Development”**
 - ◆ CMMI expands to address elicitation, development of requirements

KPA/PA Distinctions (4)

❖ **“Risk Management”**

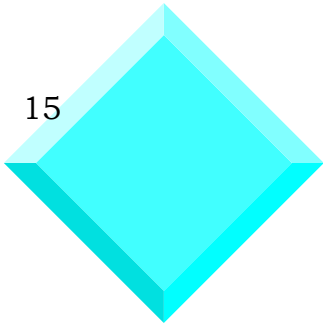
- ◆ Requirement to define risk parameters not in SW-CMM
- ◆ Parameters: e.g., probability, consequence, mitigation

❖ **“Technical Solution”**

- ◆ “Select Product-Component Solutions” (SG 1)
- ◆ SG 1 has a Pre-design focus
- ◆ Quantitative measures support alternative solution selection (e.g., cost, schedule, performance, risk)
- ◆ Relies heavily on DAR and RD process areas

❖ **“Verification” (VF)**

- ◆ Peer Reviews in fact have a higher standard in the SW-CMM (e.g., collection of PR data required in SW-CMM, is a sub-practice (= suggestion) in CMMI)



Stakeholder Reactions (1)

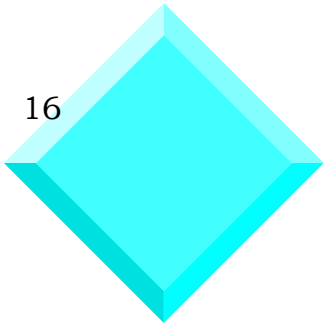
Reactions to:

◆ **The framework**

- ◆ some embraced the order/structure (i.e., software and system engineering, familiar with the SW-CMM)
- ◆ most opposed. (e.g., finance, marketing, mfg., Hardware Engineering, Electro-Mechanical Engineering)
- ◆ Generally, taught the formal Standard Operating Procedures (SOP), not the CMMI process areas
- ◆ Adapted the CMMI to the organization, vs adapting the organization to the model (as with SW-CMM)

◆ **Other (new) stakeholders**

- ◆ drastic change in inter-group coordination, interfaces
- ◆ product-related view challenged “territories”
- ◆ parent organization in Germany (culture/ geographical challenges)



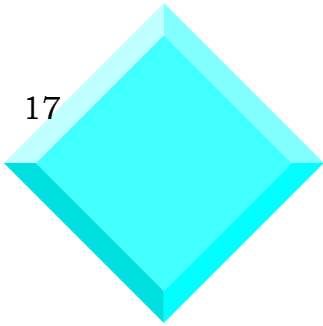
Stakeholder Reactions (2)

Reactions to:

- ◆ **“Process Champion” approach (the integrated team)**
 - ◆ recruit, empower, lead
 - ◆ processes more user-friendly, more “real-world”
 - ◆ “Ability to Perform” (reinforced with senior management)

- ◆ **The SCAMPI appraisal (June 2002)**
 - ◆ SCAMPI V1.1 was new (released about Jan 2002)
 - ◆ Lack of clear pass/fail criteria, i.e., the “grades”
 - ◆ Subjective insofar as Lead Assessor guidelines
 - ◆ Combined SCAMPI with “OPAL” (bad idea)

(Note: OPAL is Siemens’ internal assessment method, resembling the SW-CMM)



Summary

So... the question remains: which Maturity Model is best for you? ...for your business?

Augustine's Law Number XIX

“Although most products will soon be too costly to purchase, there will be a thriving market in the sale of books on how to fix them”

from *Augustine's Laws*, Norman R. Augustine, 1997