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## CAIV

*A Key Component  
of Your Business Strategy*





## ***Agenda***

- © **CAIV Primer**
- © **Get Ready for CAIV!**
- © **Trade Study Process**
- © **CAIV Enterprise**
- © **CAIV Capability Maturity Model (CAIV-CMM)**
- © **Conclusion**



## *CAIV Definition*

- © **Cost As an Independent Variable (CAIV):** An Acquisition management concept wherein cost goals are achieved through tradeoffs between cost, schedule, and performance. Cost, as an independent parameter, is addressed as part of the acquisition process. CAIV goals are:
  - © **Design to Unit Production Cost (DTUPC) goal:** Achieve the delivered unit production cost goal.
  - © **Life Cycle Cost (LCC) goal:** Minimize the total cost for the customer to acquire, operate, support and dispose of the system.



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## CAIV Cost Objectives

- © **Setting realistic but *aggressive cost objectives* early in each acquisition program**
- © ***Managing risks* to achieve *cost, schedule, and performance* objectives**
- © **Devising appropriate *metrics* for tracking progress in setting and achieving cost objectives**
- © ***Motivating* government and industry managers to achieve program objectives**
- © **Putting in place for *fielded systems* additional incentives to reduce operating and support costs**

CAIV WORKING GROUP REPORT



## ***What is CAIV ?***

- © Focuses on Life Cycle Cost
- © Customer participation required throughout Life Cycle
- © Encourages customer/contractor challenges to requirements
- © Is a Team Management Philosophy
- © Cost is *equal* in importance to design/performance when making program decisions



## ***What is CAIV ?***

- © **System cost goal based on Mission Affordability**
- © **Cost targets “Flowed Down” from Affordability Goal**
- © **User requirements and cost are considered together during design**
- © **Mandates Analytical Support for cost goals and targets**
- © **Risk analysis required**
- © **Tracks and measures results-ensures corrective action**

**Making Design Decisions Today That Ensures  
System Affordability Tomorrow**



## ***Why CAIV ?***

- © **The market place is ready for it!**
- © **Declining budgets require it**
- © **Increasing emphasis on “Best Commercial Practice” including COTS and Value Engineering necessitate it**
- © **Utilizing parametric cost models and trained professionals made it possible**

**Failure To Manage Costs - Risk Program Termination**



## ***Get Ready for CAIV !***

- ◎ **CAIV Capability Maturity Model (CAIV-CMM) used to assess an organization's competence level with CAIV practices**
  - ◎ **Framework for CAIV response authoring**
- ◎ **An integrated tool set required across the entire Contractor/Customer team**
- ◎ **Contractor/Customer team approach to developing and implementing the tool set**
- ◎ **Automated system interfaces**
- ◎ **A tool set that communicates differences among design alternatives, costs, schedule, and performance**



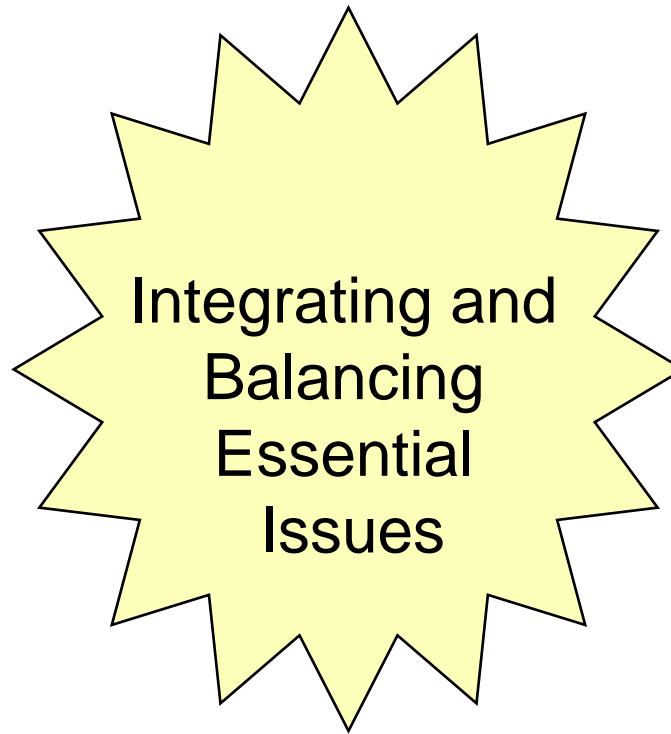
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## Tool-Set

PRICE Enterprise  
PRICE H, HL & M  
PRICE S/SL  
Sys. Eng. Tools

## Organization Involvement

PMO  
IPPD/PDT  
CAIV Mgmt.  
System Eng.  
Estimating Mgmt.



Integrating and  
Balancing  
Essential  
Issues

## Risk Assessment

Cost  
Schedule  
Technology  
Performance

## Technical Feasibility

**CAIV-CMM**  
Contractor  
Customer/Govt.  
Design Groups  
Performance Groups

**Complex Issues Require The Application of Multiple  
Tools, Skills, and Resources**



## ***Trade Study Process***

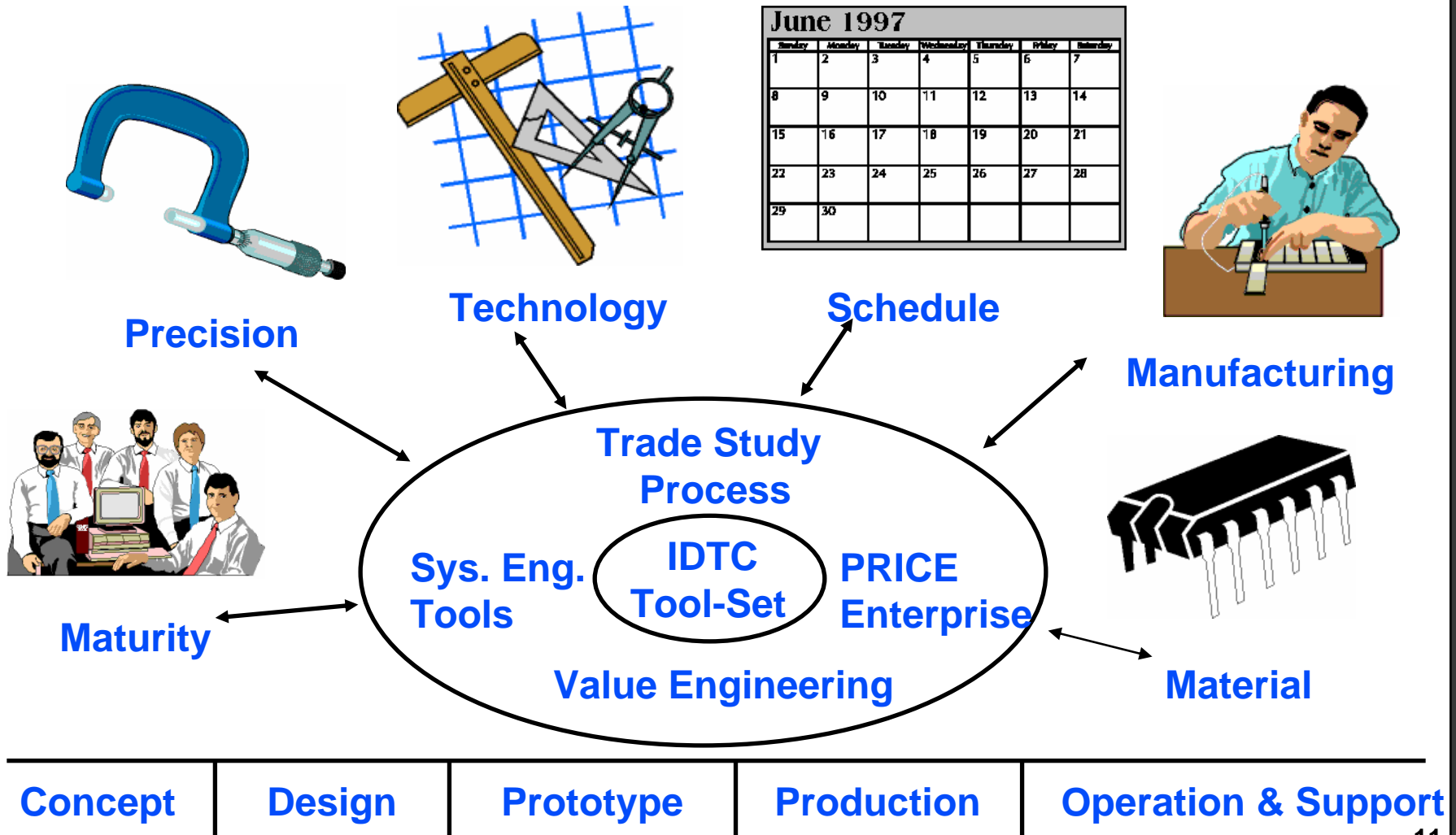
- © **Parametric model providing rapid cost analysis**
- © **Cost thinking instituted at the engineering level**
- © **Capable of performing cost performance trades from Concept through & including Operations & Support (O&S)**
- © **Integrates and balances cost, risk, schedule, and performance**

**Trade Studies Are Used As Design Tool Rather Than Confirmation Of Selected Concepts**



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## TRADE STUDY PARAMETERS



June 1997

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					



## ***Enterprise Approach - PRICE***

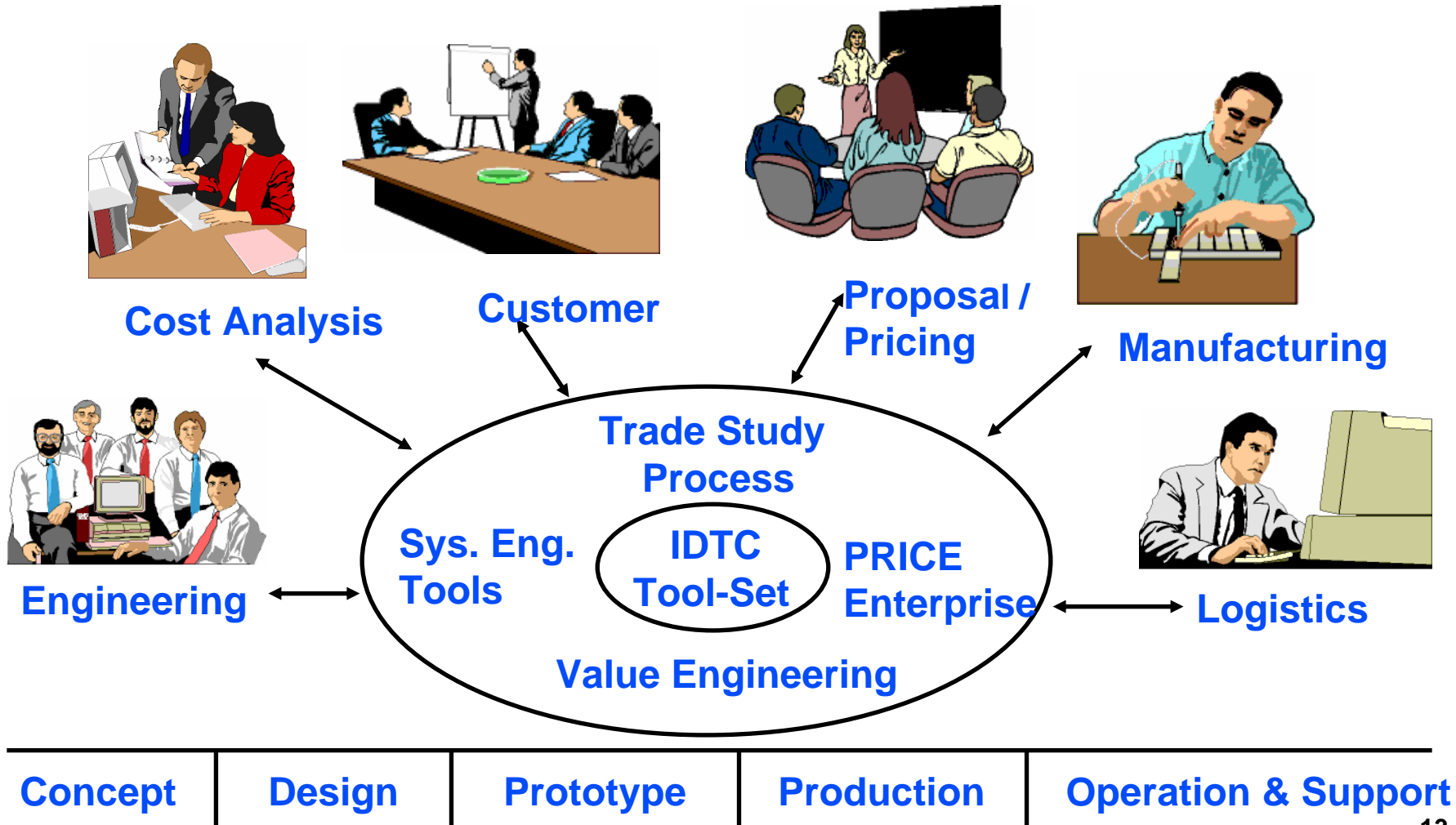
- ◎ **Enterprise tool suite consists of integrated PRICE models providing real time access to CAIV solutions**
- ◎ **Models implement Cost Estimating Relationships relating cost to non-cost parameters.....learns from your history**
- ◎ **Takes full advantage of trends in technology improvement**
- ◎ **Recognizes commercial processes and components**
- ◎ **Risk Analysis - balances cost, schedule, and performance**

**Life Cycle Cost Objectives - IRD&T, Production, O&S**



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## CAIV ENTERPRISE STRATEGY





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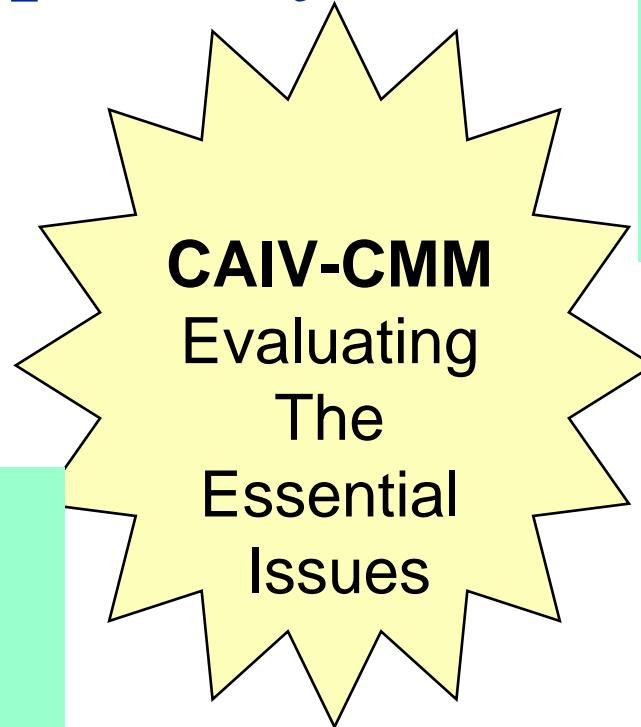
***.....now that we know about the benefits of CAIV,  
how do we respond to a CAIV proposal?***





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## CAIV Capability Maturity Model



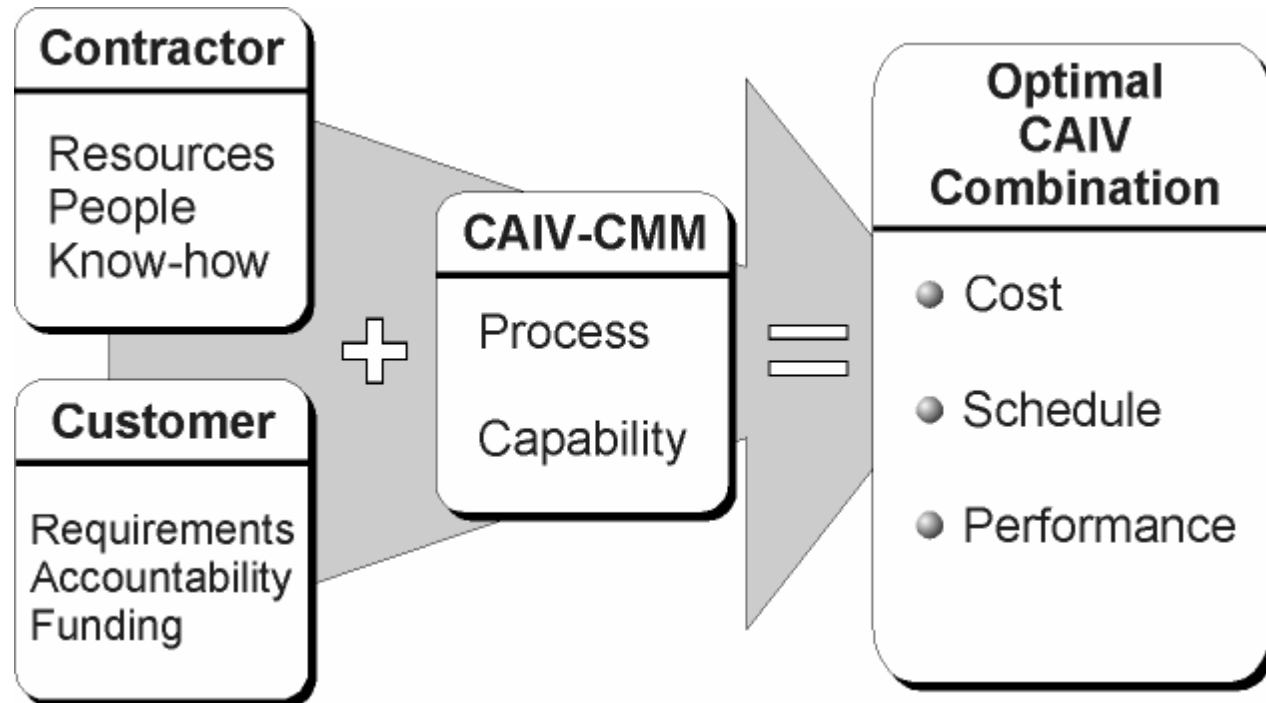
CAIV-CMM required to allow evolution to fully competent CAIV organizations.

CAIV-CMM required to appraise current status of CAIV competency.

CAIV-CMM recognizes implementation levels vary among organizations



## CAIV - CMM





## *CAIV Capability Maturity Model*

- © **Extension of SEI Process Engineering Capability Maturity Model (SE-CMM)**
- © **CAIV-CMM comprised of *domain portion* and *capability portion***
- © **Domain portion consists of four process area categories:**

<b>Engineering</b>	<b>Organization</b>
<b>Program</b>	<b>Customer</b>
- © **Capability portion has six levels of implementation:**

<b>CAIV Not Performed</b>	<b>CAIV Performed Informally</b>
<b>CAIV Process Planned and Tracked</b>	<b>CAIV Process Well Defined</b>
<b>CAIV Quantitatively Controlled</b>	<b>Optimized CAIV Enterprise</b>



## ***CAIV -CMM***

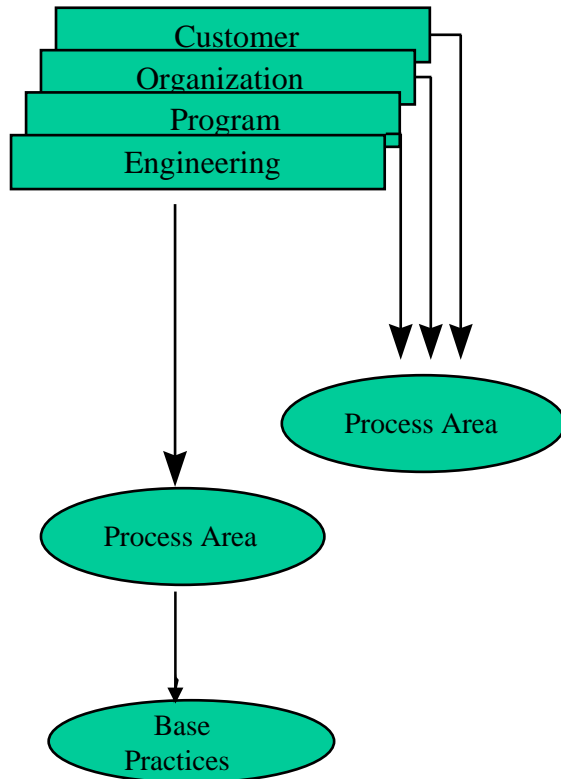
- © **CAIV-CMM concerned with establishing and performing the CAIV process**
- © **Process centers on:**
  - © **Recognizing the key performance requirements**
  - © **Performing trade-offs**
  - © **Developing an executable program**
  - © **Tracking and managing the program**
  - © **Measuring effectiveness**
  - © **Taking corrective action as necessary**



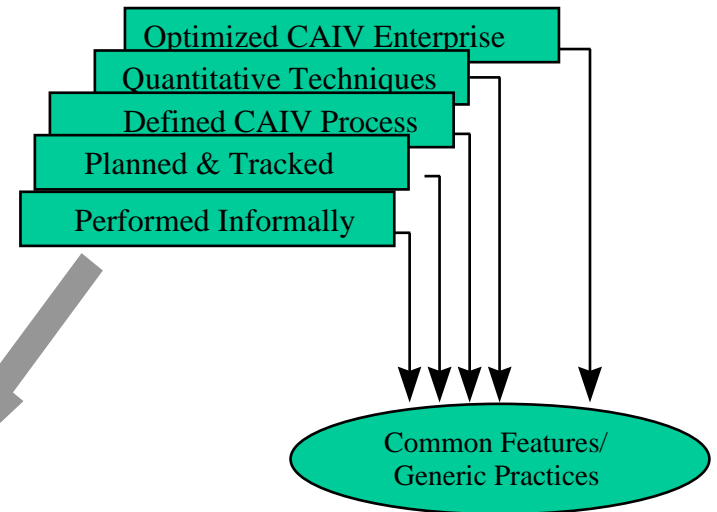
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## CAIV-CMM

### Domain Portion



### Capability Portion

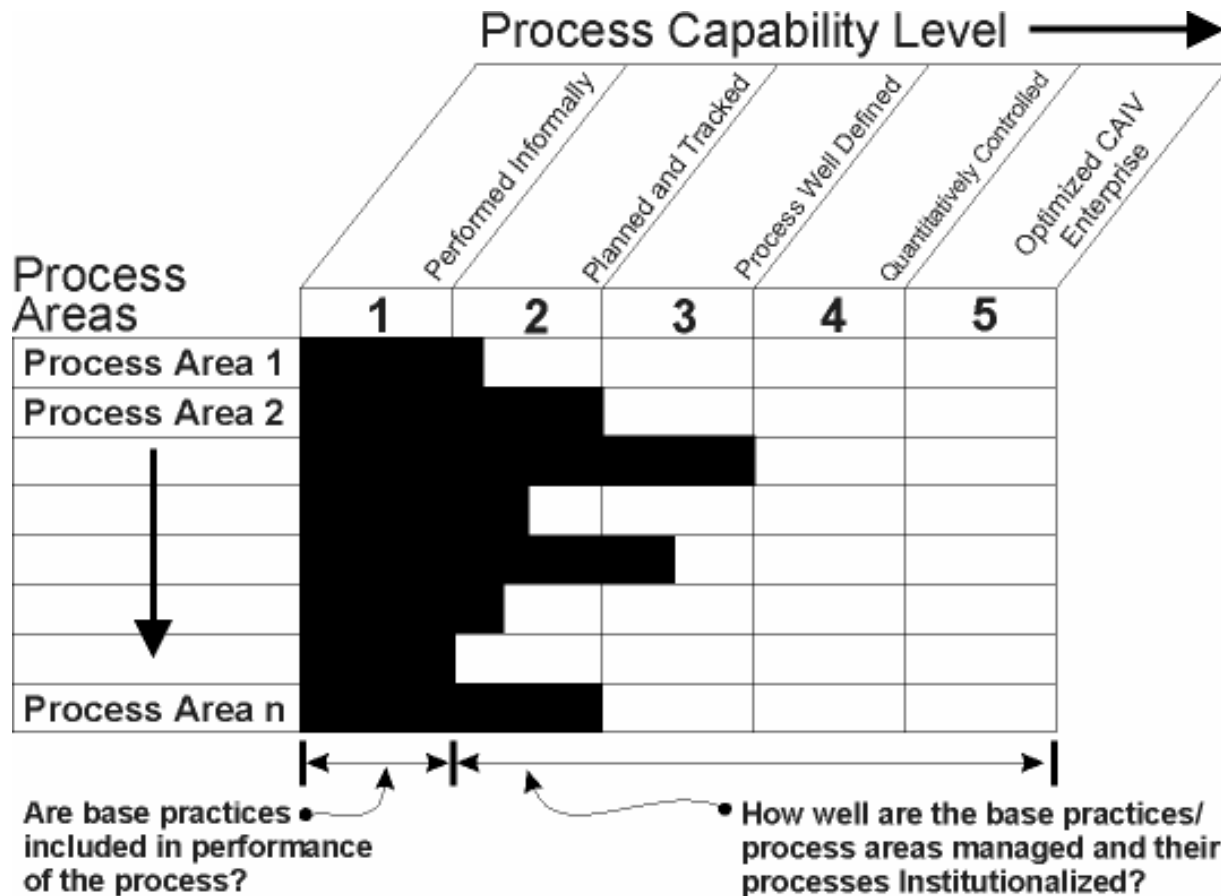


Process Area	Capability Level				
	1	2	3	4	5
	[Bar chart showing levels 1, 2, 3, 4]				
	[Bar chart showing levels 1, 2, 3]				
	[Bar chart showing levels 1, 2]				
	[Bar chart showing levels 1, 2, 3, 4]				



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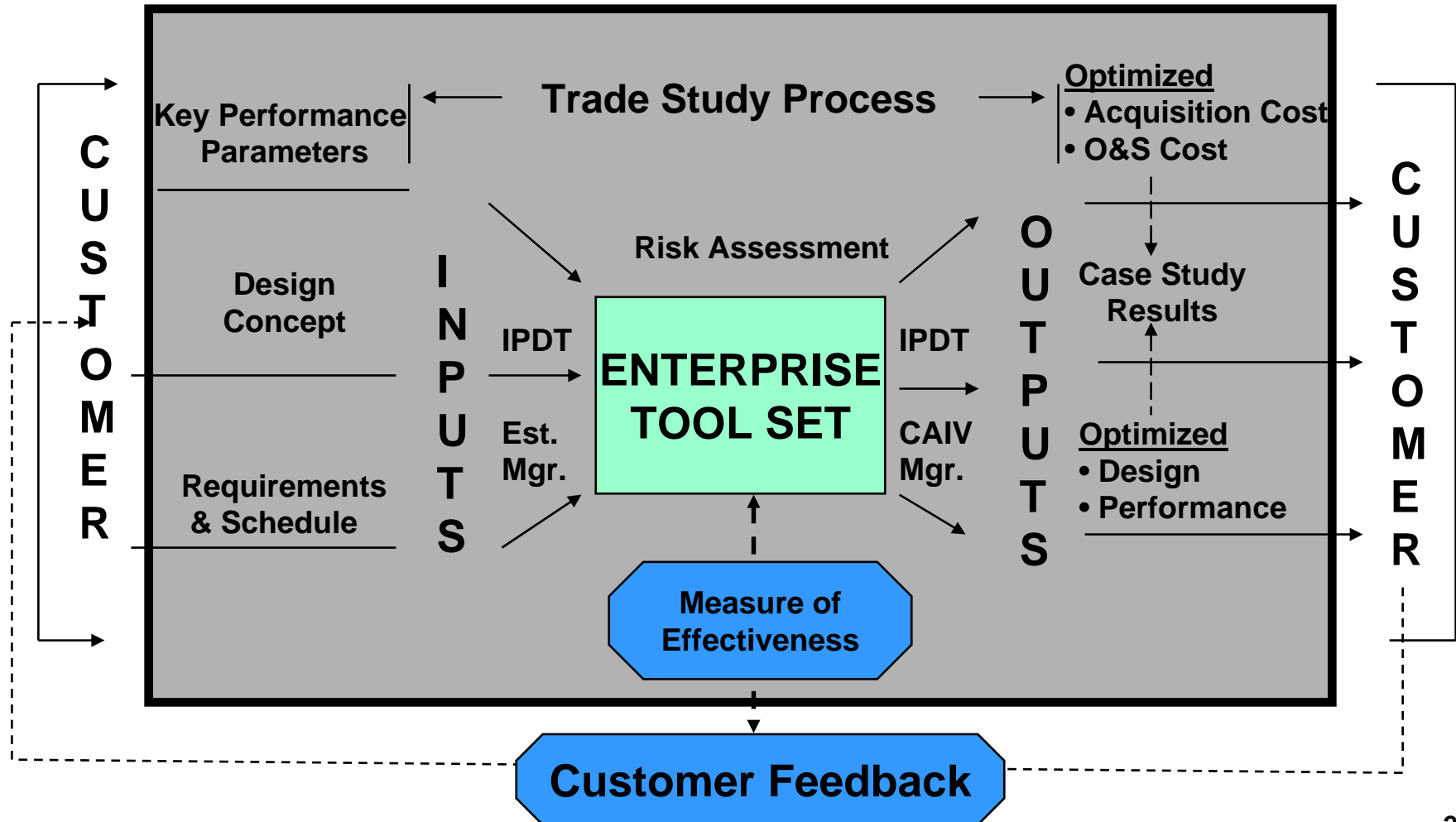
## CAIV-CMM Support Appraisal





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## CAIV-CMM Level 5 Organization





## ***CAIV Conclusion***

- © **CAIV is not just a new DOD Initiative, but good sound business practice facilitating:**
  - © **Optimized performance Cost/Schedule/Performance**
  - © **CAIV-CMM allows organizations to evaluate CAIV competencies and areas for improvement.**
  - © **Promotes Customer/Contractor communication**
  - © **Truly meeting the war fighter's need**
  - © **Realization of greater incentive award fees**