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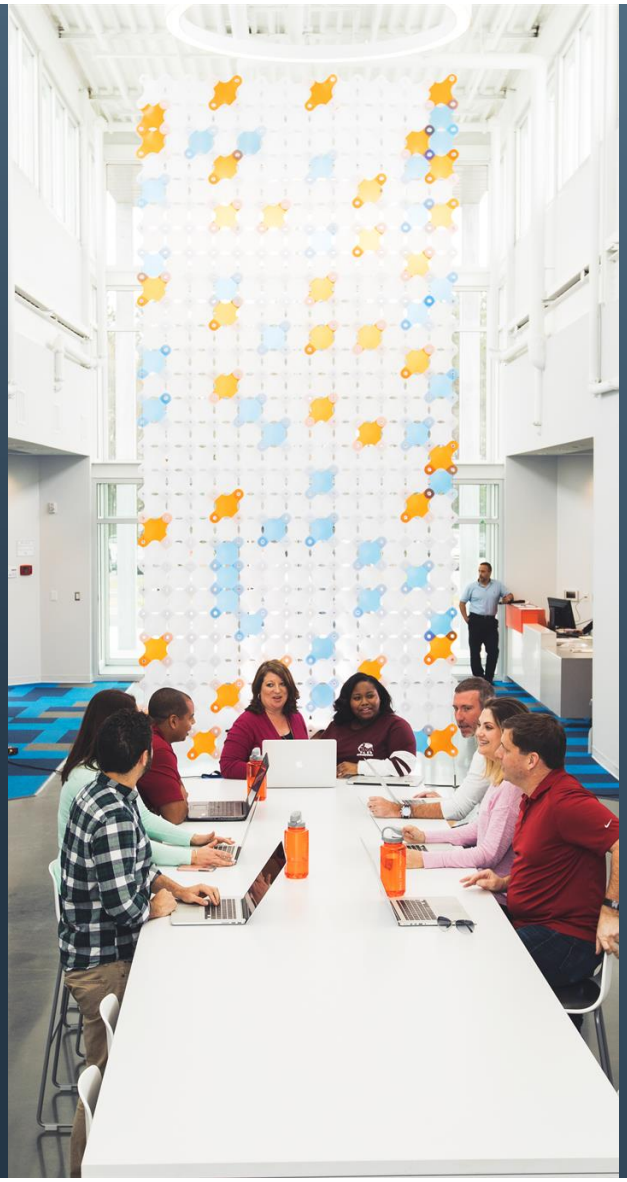


CONTRACTING FOR AGILE PROJECTS

Blaze Smallwood, CCE/A

ICEAA Conference 2019

MAY 2019

AGENDA

INTRODUCTION

CURRENT APPROACHES & CHALLENGES

A PROPOSED APPROACH

SUMMARY

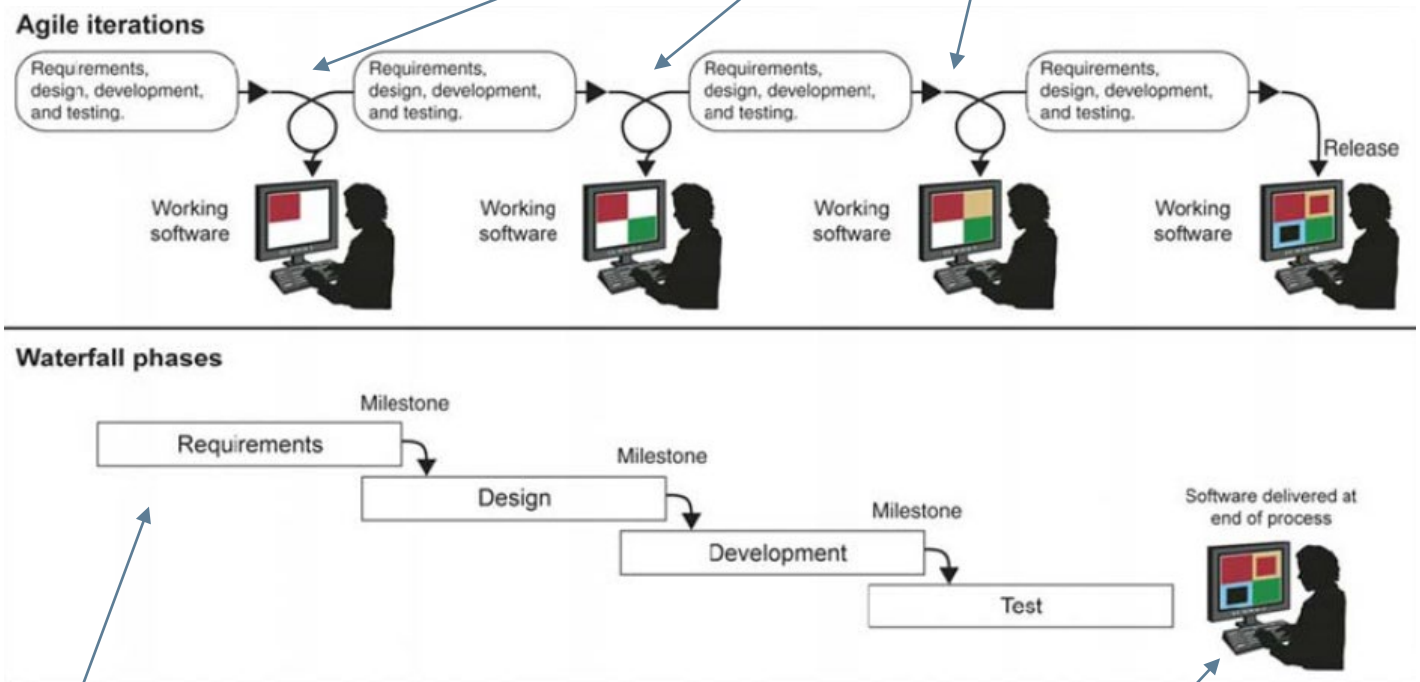
PURPOSE

- Review several contracting approaches and their advantages and disadvantages for agile projects
- Propose a new approach to contracting for agile projects, including advantages and disadvantages
- Provide a forum for attendees to discuss experiences in contracting for agile projects

AGILE VS WATERFALL

Allows for more uncertainty in requirements, particularly for those planned toward the end of the release

Encourages incorporating feedback from users/customers during development



Requires adequate knowledge of all requirements at the beginning of the project

Very difficult to incorporate feedback during the development cycle

Reference: E. Wrubel, J. Gross, "Contracting for Agile Software Development in the Department of Defense: An Introduction" 2015

CHALLENGES CONTRACTING FOR AGILE PROJECTS

Traditional Completion-Oriented Contract Structures	Agile Project Realities
Well-understood requirements that can be appropriately organized and described in a SOW	Often loosely defined requirements bounded by high-level user needs that will be fleshed out by user interactions during development
Detailed execution plan for the full project, often requiring resource-loaded work packages for EVMS tracking	Upcoming iterations planned in detail, while longer-range iterations more generally defined
Static scope over the execution of the contract, otherwise modification process is required	Scope is likely to change as customer and user priorities change and in-process software iterations are evaluated by users
Thorough set of documentation to support product delivery and execution	Emphasis on frequent deliveries of working software over thorough documentation

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= Key attributes when considering contract for a software project; See next slide for pros & cons on agile software projects

TRADITIONAL CONTRACT STRUCTURES

Consideration	Firm Fixed-Price (FFP)	Cost-Plus Incentive-Fee (CPIF)	Cost-Plus Award-Fee (CPAF)	Cost-Plus Fixed-Fee (CPFF)	Time & Materials
Principal Risk to be Mitigated	None. The contractor assumes all cost risk.	Highly uncertain and speculative labor hours, labor mix, and/or material requirements (and other things) necessary to perform the contract. The Government assumes the risks inherent in the contract -benefiting if the actual cost is lower than the expected cost-losing if the work cannot be completed within the expected cost of performance.			
Use When..	• The requirement is well-defined. • Contractors are experienced in meeting it. • Market conditions are stable. • Financial risks are otherwise insignificant.	An objective relationship can be established between the fee and such measures of performance as actual costs, delivery dates, performance benchmarks, and the like.	Objective incentive targets are not feasible for critical aspects of performance. Judgmental standards can be fairly applied. Potential fee would provide a meaningful incentive.	Relating fee to performance (e.g., to actual costs) would be unworkable or of marginal utility.	No other type of contract is suitable (e.g., because costs are too low to justify an audit of the contractor's indirect expenses).
Elements	A firm fixed-price for each line item or one or more groupings of line items.	• Target cost • Performance targets (optional) • A minimum, maximum, and target fee • A formula for adjusting fee based on actual costs and/or performance	• Target cost • Standards for evaluating performance • A base and maximum fee • Procedures for adjusting fee, based on performance against the standards	• Target cost • Fixed fee	• A ceiling price • A per-hour labor rate that also covers overhead and profit • Provisions for reimbursing direct material costs
Contractor is Obliged to:	Provide an acceptable deliverable at the time, place and price specified in the contract.	Make a good faith effort to meet the Government's needs within the estimated cost in the Schedule.			Make a good faith effort to meet the Government's needs within the ceiling price.
Contractor Incentive (other than maximizing goodwill) [1]	Generally realizes an additional dollar of profit for every dollar that costs are reduced.	Realizes a higher fee by completing the work at a lower cost and/or by meeting other objective performance targets.	Realizes a higher fee by meeting judgmental performance standards.	Realizes a higher rate of return (i.e., fee divided by total cost) as total cost decreases.	
Typical Application	Commercial supplies and services.	Research and development of the prototype for a major system.	Large scale research study.	Research study	Emergency repairs to heating plants and aircraft engines.

Reference: https://www.acq.osd.mil/dpap/ccap/cc/jcchb/Files/Topical/Contract_Type_Comparison_Table/resources/contract_type_table.docx

CONTRACT PROS & CONS FOR AGILE PROJECTS

Contract Type	Pros for Agile Projects	Cons for Agile Projects
FFP	• Limits government risk, while holding vendor accountable for delivery	• Requires well-defined requirements • Not flexible for scope additions / reprioritization
CPIF	• Provides flexibility to incentivize performance in various ways • Balances cost control against other measures of performance	• Can be complex for vendor to manage multiple incentives • Potential for extensive negotiation of incentives
CPAF	• Provides ability to reward performance against negotiated terms • Provides mechanism for delivery accountability	• Incentive is likely too subjectively derived to explicitly measure performance • Extensive negotiation of award terms
CPFF	• Incentivizes cost control while holding contractor accountable for delivery	• Limited ability to incentivize performance on top of cost control
T&M	• Provides most flexibility to change scope in process	• No mechanism for holding vendor accountable for delivery

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CPAF	• Provides ability to reward performance against negotiated terms • Provides mechanism for delivery	• Incentive is likely too subjectively derived to explicitly measure performance
CPFF	• Incentivizes cost control while holding	• Limited ability to incentivize on top of cost control
T&M	• Provides most flexibility to change scope in process	• No mechanism for holding vendor accountable for delivery

Structure used for the proposed solution in the following slides

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PROPOSED APPROACH: CPIF TAILORED FOR AGILE PROJECTS

- Structure a CPIF to incentivize the contractor based on cost (required of CPIF) and performance in terms of capabilities delivered during specified timeline
  - Define prioritized capabilities, not requirements
  - Minimum Viable Product (MVP): Includes “must haves” aka “Core Capabilities”
  - Trade Space Capabilities (TSCs): Capabilities managed on a prioritized backlog delivered in addition to the MVP
  - MVP delivery is a prerequisite for earning any cost or performance incentive fee
  - Contractor has discretion to balance cost control against delivering additional capability

INCENTIVE FEE STRUCTURE SUMMARY

Total Fee
(Example: Target: 9%; Min: 0%: Max: 12%)

** *MVP is prerequisite for fee*:
Both fees are zero if MVP is not completed within specified timeline

Cost Incentive Fee

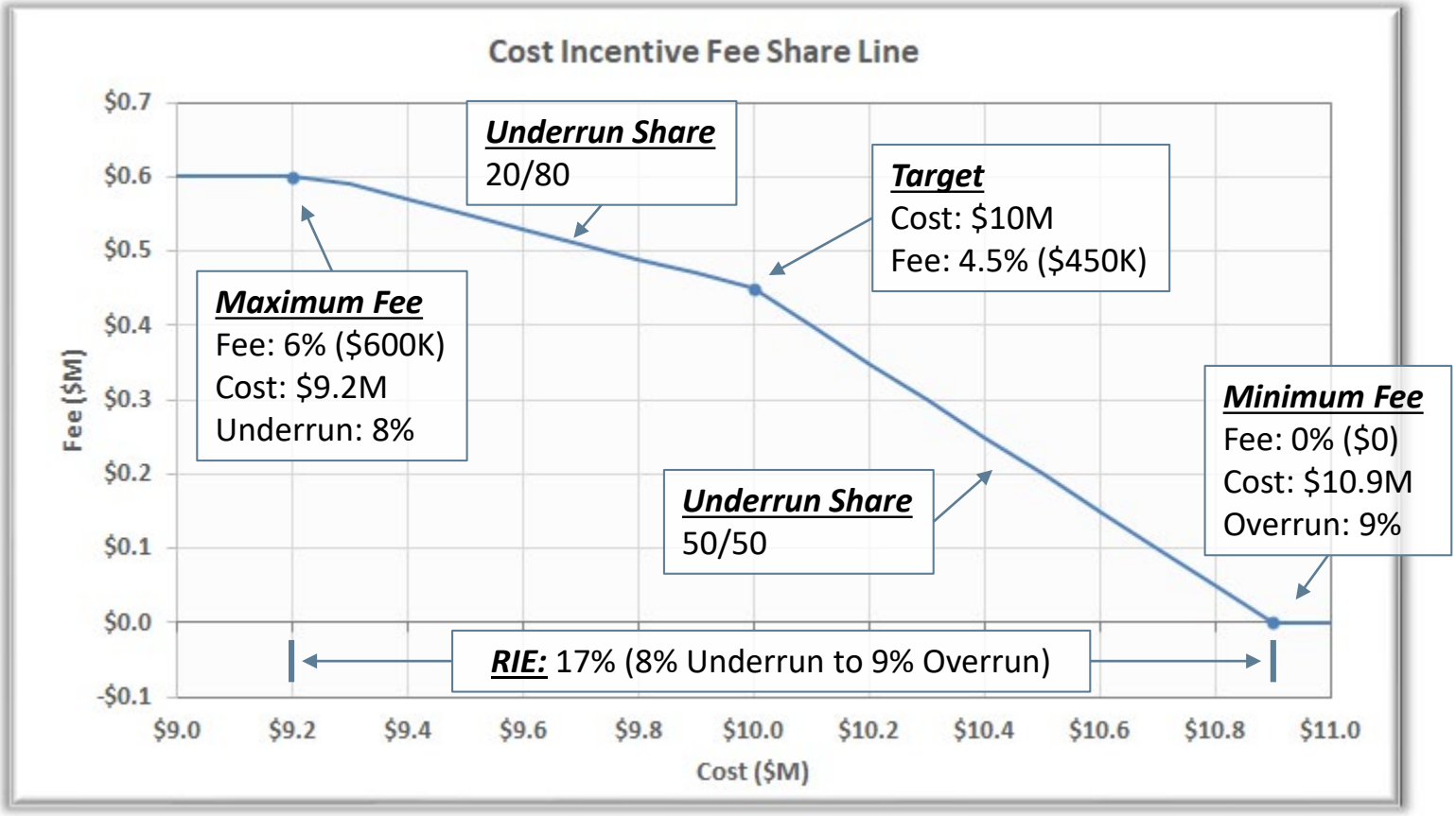
Attribute	Description	Example
Target Cost	Negotiated with winning vendor based on bid and IGCE for MVP plus fair portion of TSCs	$10M
Fee % Range	Target Fee % (of Target Cost) with Minimum and Maximum	Target: 4.5% Minimum: 0% Maximum: 6%
Share Ratio	Rate a which fee is decremented/incremented as cost overruns/underruns	Overrun: 50/50 Underrun: 20/80
Range of Incentive Effectiveness (RIE)	Range of actual cost outcomes where incentive fee varies (typically expressed as % of target cost)	17% (8% underrun to 9% overrun)

Performance Incentive Fee

Attribute	Description	Example
Fee % Range	Target Fee % (of Target Cost) with Minimum and Maximum	Target: 4.5% Minimum: 0% Maximum: 6%
MVP Portion	% of Maximum Performance Fee Earned if MVP is completed on schedule	20% (1.2% of Max Performance Fee)
TSC Portion	% of Maximum Performance Fee Earned depending on how much TSC is completed on schedule	80% (4.8% of Max Performance Fee)
TSC Fee Earned	• Based on backlog of TSCs that Government prioritizes using negotiated scale • Vendor chooses TSCs to complete, balancing cost and Gov priority	Each TSC given priority score 1-5 (5 being highest); Max fee achieved if sum of priority scores for TSC completed >= 60

INCENTIVE FEE STRUCTURE: COST INCENTIVE

Best illustrated in an example:



** *MVP is prerequisite for fee*: Cost incentive fee is zero if MVP is not completed within specified timeline

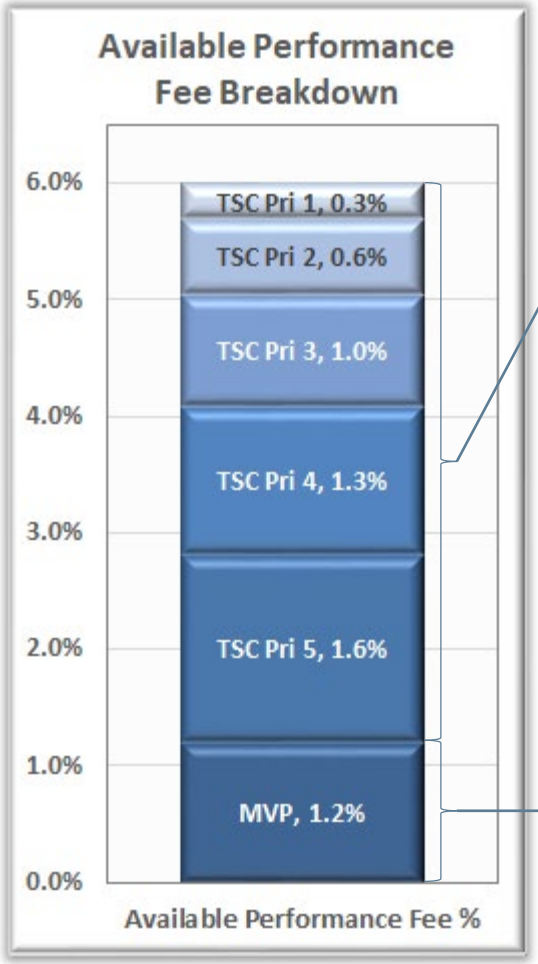
INCENTIVE FEE STRUCTURE: PERFORMANCE INCENTIVE

Continuing the example:

Performance Fee Available	% of Target Cost
Maximum Fee	6%
Target Fee	4.5%
Minimum Fee	0%

Attribute	Value
MVP Portion (Performance Fee Earned if MVP completed on schedule)	20% of available performance fee (1.2%)
TSC Portion (Performance Fee Available for TSCs completed on top of MVP within timeline)	80% of available performance fee (4.8%)
Government Priority Scale for TSC Backlog	1-5 (5 is highest priority)

** *MVP is prerequisite for fee*:
Performance fee is zero if MVP is not completed within specified timeline



TSC performance fee breakdown by priority determined by how Government prioritizes TSC backlog *(see next slide for example)*

MVP must be completed on time before any TSC performance fee can be earned

Gives vendor some performance reward if MVP is completed on time

INCENTIVE FEE STRUCTURE: TRADE SPACE CAPABILITY (TSC) PORTION OF PERFORMANCE INCENTIVE

Original Trade Space Capability Backlog

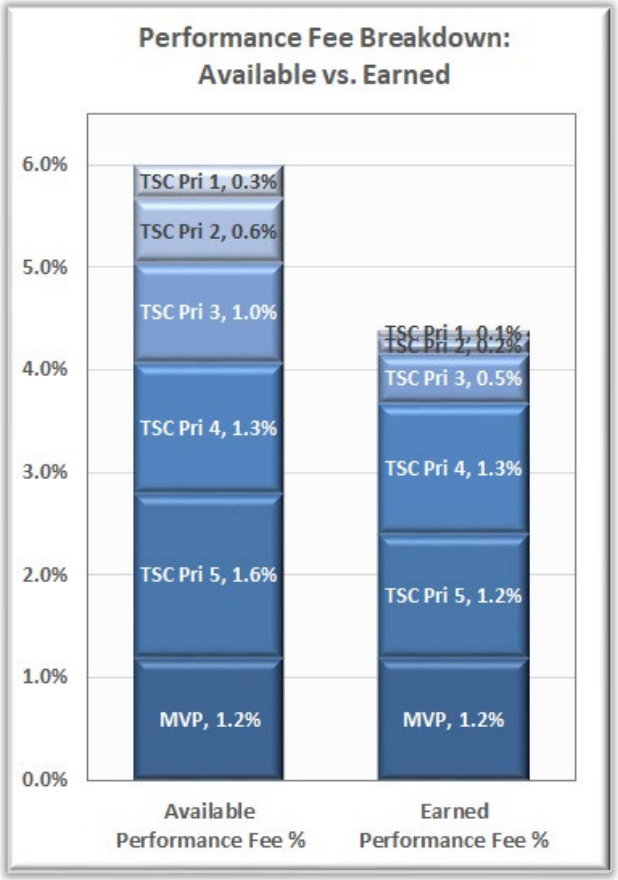
Key	Capability Name	Priority Points	Available Fee ($M)
1	Capability 1	5	$0.040
2	Capability 2	5	$0.040
3	Capability 3	5	$0.040
4	Capability 4	5	$0.040
5	Capability 5	4	$0.032
6	Capability 6	4	$0.032
7	Capability 7	4	$0.032
8	Capability 8	4	$0.032
9	Capability 9	3	$0.024
10	Capability 10	3	$0.024
11	Capability 11	3	$0.024
12	Capability 12	3	$0.024
13	Capability 13	2	$0.016
14	Capability 14	2	$0.016
15	Capability 15	2	$0.016
16	Capability 16	2	$0.016
17	Capability 17	1	$0.008
18	Capability 18	1	$0.008
19	Capability 19	1	$0.008
20	Capability 20	1	$0.008
	Total	60	$0.48

Final Trade Space Backlog/Outcomes

Key	Capability Name	Priority Points	Completed	Fee Earned ($M)
1	Capability 1	5	X	$0.040
2	Capability 2	5	X	$0.040
3	Capability 3	5		
4	Capability 4	5	X	$0.040
P-6	Pop-up Capability 6	5		
5	Capability 5	4	X	$0.032
6	Capability 6	4	X	$0.032
7	Capability 7	4		
8	Capability 8	4		
17	Capability 17	4	X	$0.032
P-1	Pop-up Capability 1	4	X	$0.032
P-3	Pop-up Capability 3	4		
P-12	Pop-up Capability 12	4		
9	Capability 9	3		
10	Capability 10	3		
11	Capability 11	3		
12	Capability 12	3	X	$0.024
P-5	Pop-up Capability 5	3		
P-11	Pop-up Capability 11	3	X	$0.024
P-14	Pop-up Capability 14	3		
13	Capability 13	2		
14	Capability 14	2		
15	Capability 15	2		
16	Capability 16	2		
P-2	Pop-up Capability 2	2	X	$0.016
P-4	Pop-up Capability 4	2		
P-8	Pop-up Capability 8	2		
P-13	Pop-up Capability 13	2		
P-15	Pop-up Capability 15	1	X	$0.008
18	Capability 18	1		
19	Capability 19	1		
20	Capability 20	1		
P-7	Pop-up Capability 7	1		
P-9	Pop-up Capability 9	1		
P-10	Pop-up Capability 10	1		
	Total Backlog Points	101		$0.320
	Total Points Completed	40		

Provides GOV mechanism to:

- Add emergent scope
- Reprioritize existing scope



Original TSC backlog:

- Sets "bar" for maximum TSC portion of performance fee
- Sets priority scale by which fee is earned and backlog can be edited

** Requires all TSC items to have well-defined acceptance criterion

PROS & CONS OF PROPOSED AGILE CPIF APPROACH

Pros	Cons
Incentivizes performance centered on user-oriented outcomes (i.e. capabilities implemented)	Cost and performance incentive structure can be complex for vendors to manage (balancing cost against customer priority)
Provides mechanism for Government to reprioritize and edit capability backlog during execution	Requires solid understanding of MVP to set target cost (and schedule) at a place that leaves room for TSC
Enables scope flexibility, while still holding vendor accountable for delivering minimum capability set (MVP)	Requires well-defined acceptance criterion for MVP and TSC items based on solid test cases – may be difficult to define upfront
Incentivizes cost control, as well as capability-centered performance	Requires vendors with mature agile processes, test capabilities, and willingness to be flexible – limits vendor pool

For agile software deliveries, the pros justify risk acceptance on cons

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- Traditional contract structures that only incentivize cost and schedule are not sufficient for agile projects
- If the Government wants to acquire software in an agile manner but still hold vendors accountable for delivery, it needs to get creative with its contract strategies
- Proposed agile-oriented CPIF structure provides a viable option for balancing accountability with flexibility

THANK YOU

For more information, contact . . .

Blaze Smallwood
Lead Associate

Booz | Allen | Hamilton

Booz Allen Hamilton Inc.
Office 309.359.3160
Mobile 619.850.6123
smallwood_blaze@bah.com