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Exhibit R-2, PB 2010 Office of Secretary Of Defense RDT&E Budget Item Justification **DATE:** May 2009

APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE					
0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 3 - Advanced Technology Development (ATD)					PE 0603781D8Z Software Engineering Institute (SEI)					
COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	24.719	31.072	31.298						Continuing	Continuing
P781: Software Engineering Institute (SEI)	21.698	28.056	23.761						Continuing	Continuing
P783: Software Producibility Initiative	3.021	3.016	7.537						Continuing	Continuing

A. Mission Description and Budget Item Justification

Software is key to meeting DoD's increasing demand for high-quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems.

Starting in 2009, Project 781 funds the technology development and transition activities of the Software Engineering Institute (SEI) at Carnegie Mellon University. The SEI is an R&D Laboratory Federally Funded Research and Development Center (FFRDC) sponsored by the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics. It was established in 1984 as an integral part of the DoD's software initiative to identify, evaluate, and transition high-leverage software engineering technologies and practices. The SEI fosters disciplined software engineering practices by DoD acquisition and life-cycle support programs and by the industrial base where the bulk of defense software is produced. The Institute works across government, industry, and academia to: (1) improve current software engineering activities from acquisition, technical, and management perspectives; (2) facilitate rapid, value-added transition of software engineering technology into practice; and (3) evaluate and calibrate emerging software engineering technologies to determine their potential for improving the evolution of software-intensive DoD systems.

The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs. FY 2005 focus areas are: Acquisition Practices for DoD Software-Intensive Systems (including pilot demonstrations of new technologies, dissemination of lessons learned, and provision of selected important services to the DoD acquisition community); Software Engineering Technical Practices (including survivable systems practices, software architecture technology, software component technology, performance-critical systems, and integration of software-intensive systems); and Software Engineering Management Practices [including personal and team software development processes, software engineering measurement and analysis, and Capability Maturity Model Integration (CMMI)].

P783 of this funding line includes the Software Produceability Initiative. The role of software in major Defense acquisition programs has been steadily increasing. Much of the mission functionality demanded from programs such as F/A-22, JSF, Future Combat System, and many others is embodied in large, complex software systems. Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromises. These shortcomings can frequently be

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traced to underpowered software development technologies not up to the task of developing the scale and complexity of software needed. Despite the large role of the commercial sector in advancing software technology, there are many key aspects of complex, distributed, robust systems crucial to DoD that are not being addressed directly by commercial technology efforts, as our experience over the past decade shows. The Software Produceability Initiative will focus on developing and transitioning more powerful and effective software development science, techniques, tools, and technologies to improve our ability to design, build, test and sustain software and software intensive systems.

This PE also includes support to find, evaluate, and test innovative technologies emerging from non-traditional sources. Private sector investment has created rapid advances in technology primarily in information technology and related electronic components and devices. Obtaining an early, accurate understanding of the technological advances that are emerging from small, innovative companies has been problematic for the Department of Defense (DoD) due to these types of companies either overlooking or even avoiding federal sales opportunities. Further, once such innovative technologies become commercially available they can be rapidly obtained by insurgents for terrorist actions. These funds will be used to discover emerging technologies, evaluate their potential to fit DoD needs, and where appropriate conduct critical tests of the components or software under DoD conditions. The facilitation of early interactions and meaningful information exchanges between the innovative companies and DoD users will accelerate the application of emerging technical solutions to DoD needs, reduce development costs, and avoid potentially disastrous technological surprises from insurgent use of such new technology. In addition, it is important to understand how developments in commercial technology might impact existing DoD programs and systems. Equally important, new commercial technologies may require new DoD policies on the use of the technology or a modification to existing DoD policy.

B. Program Change Summary (\$ in Millions)

	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>
Previous President's Budget	25.726	31.244	31.870	
Current BES/President's Budget	24.719	31.072	31.298	
Total Adjustments	-1.007	-0.172	-0.572	
Congressional Program Reductions				
Congressional Rescissions		-0.172		
Total Congressional Increases				
Total Reprogrammings	-0.250			
SBIR/STTR Transfer	-0.706			
Undistributed reductions	-0.051			
Internal realignment of funds			-0.160	
Other			-0.412	

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COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
P781: Software Engineering Institute (SEI)	21.698	28.056	23.761						Continuing	Continuing

A. Mission Description and Budget Item Justification

Software Engineering Institute is key to meeting DoD's increasing demand for high-quality, affordable, and timely national defense systems. There is a critical need to rapidly transition state-of-the-art technology and best practices to improve the acquisition, engineering, fielding, and evolution of software-intensive DoD systems.

The SEI enables the exploitation of emerging software technology by bringing engineering discipline to software acquisition, development, and evolution. The SEI focuses on software technology areas judged to be of the highest payoff in meeting defense needs.

Private sector investment has created rapid advances in technology primarily in information technology and related electronic components and devices. Obtaining an early, accurate understanding of the technological advances that are emerging from small, innovative companies has been problematic for the Department of Defense (DoD) due to these types of companies either overlooking or even avoiding federal sales opportunities. Further, once such innovative technologies become commercially available they can be rapidly obtained by insurgents for terrorist actions. DoD needs opportunities to discover emerging technologies, evaluate their potential to fit DoD needs, and where appropriate conduct critical tests of the components or software under DoD conditions. Facilitating early interactions and meaningful information exchanges between the innovative companies and DoD users will accelerate the application of emerging technical solutions to DoD needs, reduce development costs, and avoid potentially disastrous technological surprises from insurgent use of such new technology. Based on workshops and interactions with these companies and the DoD acquisition community in 2007 and 2008, the need emerged for funding to support rapid evaluation and test of these technologies that can't be accommodated by the normal acquisition program budget process.

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2008	FY 2009	FY 2010	FY 2011
Acquisition Practices for DoD Software Intensive Systems	2.443	2.426	2.567	
<i>FY 2008 Accomplishments:</i> * Helped more than 50 key acquisition programs achieve their objectives by working directly with them to apply new technologies and conduct experiments with maturing SEI products and services in real-world acquirer contexts.				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p>* Provided an on-site presence (as needed) to assist acquisition officials in the improvement of their software-intensive system-acquisition activities; for example, maintained on-site presence in Los Angeles, CA to provide direct support to the USAF Space and Missile Systems Center.</p> <p>* Captured knowledge from engagements with acquisition organizations, integrated it with lessons learned from similar work, and helped to impart that knowledge to the acquisition community. Accomplished this through means such as conferences, workshops, courses, briefings, technical reports, articles, advocacy, and participation in acquisition communities of practice.</p> <p>* Continued to provide liaison activity with external organizations and provided leadership roles within National Defense Industrial Association (NDIA), the International Council on Systems Engineering (INCOSE), the Program Management Institute (PMI), Practical Systems and Software Measurement (PSM), and the Office of the Secretary of Defense (OSD).</p> <p>* Developed and delivered Software Acquisition Survival Skills (SASS) course to help government students identify whether their programs are suffering from common failure patterns, construct "get well" plans to recover, and position their programs to avoid these problems if they are able to affect early lifecycle planning (over 45 offerings of the course to approximately 700 students).</p> <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> * Continue to provide direct support to key acquisition programs. * Pursue a balanced portfolio of program support and organizational support to aid in persistent organizational learning across multiple programs. * Establish an increased and persistent on-site presence augmented by a solid reach back capability in response to needs and requests from key acquisition programs and organizations. * Identify potential areas of focus to address common areas of concern across multiple programs. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> * Continue to help DoD and other government acquirers improve their ability to acquire, deploy, and sustain systems and capabilities. * Help identify opportunities for the SEI to create, apply, and amplify technologies that respond to customer needs. 				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> * Establish more on-site presence at key acquisition organizations to help high-visibility programs achieve their objectives in the areas of software systems engineering and technology adoption. * Identify potential areas of focus to address common areas of concern across multiple programs. 				
<p>Software Engineering Technical Practices</p> <p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> *Worked to establish the routine use of disciplined approaches to improve the survivability and resiliency of public and private organizations, and their networked systems by identifying and developing security management frameworks, evaluations, models, practices, and policy guidance that allow organizations to effectively and efficiently protect their mission-critical assets and systems, and focusing on the identification, analysis, and management of organizational, operational, and technical risks throughout the system development life cycle. *Provided security practices and information assurance training and education to equip personnel in the Department of Defense, federal civilian agencies, and the private sector with the knowledge, skills, and abilities required to improve the survivability of networked systems and computer network defense. *Developed methods and tools forming the backbone of government-wide situational awareness operations such as CENTAUR and EINSTEIN, supporting the US-CERT, JTF-GNO, and Service and Regional Command Computer Network Defense Service Providers. *Published a standard for representing computer security incident reports in the Internet Engineering Task Force (IETF). *Served as the hub of malicious code analysis activities across 25 federal government organizations through the CERT coordination center and its analysis methods, tools, and training. *Provided technical assistance to the United States Secret Service in the forensic analysis of seven terabytes of data. * Used the CERT Clustered Computing Analysis Platform and CERT developed forensic tools to support collaboration with law enforcement analysts and the U.S. District Attorney's Office. * Provided online training in areas of Information Security and Assurance, Computer Forensics, and Incident Response through the SEI's Virtual Training Environment (VTE) to 96,000 users across government and industry, including to Service members deployed in Iraq, Kuwait, Afghanistan, Okinawa, Korea, and other forward locations. 	14.593	16.734	17.021	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> * Provided direct support to numerous DoD programs through the SEI's Survivable Enterprise Management group, including to Airborne Networks, Future Combat Systems (FCS), Army Research Office (ARO), Counterintelligence Field Activity (CIFA), and the National and Personnel Security Research Center (PERSEREC). * Completed case codebook, data dictionary, and decision rules for Counterintelligence Field Activity (CIFA) through the "Insider Threat Project: Modeling Human Behavior in Cyberspace" project. * Guided transition to service-oriented architectures using the SMART methodology at Army CERDEC C2D and Air Force 653rd wing. * Participated in delivering final report of the OSD Biometrics task force. * Developed a convergence plan for service oriented architecture initiatives for the Office of the Army Chief Information Officer. * Provided recommendations on dealing effectively with real-time, safety-critical, embedded (RTSCE) systems issues for the Army Strategic Software Improvement Program (ASSIP). * Presented assurance cases and reliability lessons at ESC workshop. * Provided technical support to Air Force, Army, and Navy programs using Software Architecture Technology (SAT) techniques, methods and guidelines. * Applied pilot-ready version of the Mission Thread Workshop to the Navy's CG(X) program. <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> * Transition vulnerability analysis and malicious code analysis tools and techniques to response teams with national responsibility. * Expand pilot opportunities, transition resiliency engineering concepts through coursework, and by performing independent assessments of organizational competency for select customers. * Work with pilot organizations to quantify relative insider threat levels. * Develop proof-of-concept prototypes for a targeted language environment. * Transition security practices, tools, and methodologies to the DoD information assurance workforce through the Virtual Training Environment. * Increase collaboration with the DoD in support of efforts to secure the defense industrial base (DIB) and global supply chain. 				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> * Expand on the work initiated with the Air Force Cyber Command Task Force to transition computer network operations, risk management, and force development capabilities to AFCYBER. * Mature and transition emerging technologies generated by work in network-centric operations and systems of systems, addressing how to operate effectively in an environment that requires large-scale distributed collaboration, is constrained by acquisition practices. * Enhance the SOA research agenda and expand a community of interest around it. * Apply SoS Navigator methods to address new problems of distributed collaboration, and refine best practices in the acquisition of systems of systems. * Apply assessment and improvement instruments, collect data from these experiences, and develop a comprehensive reference model for architecture competence. * Investigate the applicability of system and SoS architecture evaluation methods to enterprise architecture, and develop a body of anecdotal evidence supporting their effectiveness. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> * Develop training courses and workshops for the Resiliency Engineering Framework. * Develop training standards, curriculum material, and courses in software assurance. * Develop tools and training to support the DoD cyber warfare mission. * Develop functional extraction-based tools for correctness verification and component composition. * Codify System of System (SoS) Navigator tools and methods and develop tutorials. * Extend Service Migration and Reuse Technique (SMART) and develop additional guidelines and methods to support more phases of the SOA-based systems development process. * Develop repeatable workshops on acquisition in a system-of-systems context. * Evolve the Service Oriented Architecture research agenda to include broad sets of stakeholders and keep it current with all external research progress. * Develop Model Based Engineering (MBE) life-cycle practices and two courses on architectural modeling using MBE and MBE practices. * Develop practices for managing the success potential of distributed, multi-enterprise programs and projects. * Refine and elaborate the economic and design foundations for architecture evolution and their implications for using architecture-centric practices throughout the lifecycle. 				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> * Investigate the role of architecture in Ultra Large Scale (ULS) System evolution including ongoing research in mechanism design and computational emergence. * Refine and elaborate a comprehensive reference model for architecture competence and write case studies about assessing and improving architecture competence. * Write case studies about the synergistic use of the mission thread workshop, SoS and system architecture evaluation. * Write a case study about combined use of assurance cases and certifiable code analysis to a medical device challenge problem. * Apply Predictable Assembly from Certifiable Code (PACC) technologies to networked systems, with emphasis on mobile ad hoc sensor nets. * Publish programmer guidelines, idioms, patterns, and techniques for automated analysis of code and generation of objective evidence of program behavior. * Investigate the impact of multi-core architecture and parallel application on predictability 				
<p>Software Engineering Management Practices</p> <p><i>FY 2008 Accomplishments:</i></p> <ul style="list-style-type: none"> *Maintained the CMMI Product Suite by creating, maintaining, and appropriately updating or enhancing products, including guidance for small organizations and appraisal and process improvement courseware. *Completed the transition from CMMI v1.1 to v1.2; All course offerings and appraisals, delivered by either the SEI or its Partners, are with version 1.2 of the CMMI for Development model. *Continued the transition of CMMI into practice: more than 94,000 individuals have been officially trained in CMMI; more than 3,000 organizations have been officially appraised against CMMI. * Published a book titled CMMI and Six Sigma: Partners in Process Improvement. * Documented and published the CMMI Architecture * Released CMMI for Acquisition, version 1.2, (CMMI-ACQ, v1.2); Published CMMI for Acquisition Primer, v1.2. * Created and offered one-day upgrade training for the CMMI-ACQ, v1.2 model *Established SCAMPI A and ARC-compliant B&C appraisals system for the CMMI-ACQ v1.2 model * Provided additional guidance on process development for special organizational interests (e.g., safety) through new business rules on how to develop and use a "CMMI Focus Topic" 	4.662	3.943	4.173	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> * Continued to focus on the value and integrity of CMMI results. * Developed the Lead Appraiser Quality Program. * Implemented certification for High Maturity Lead Appraisers program. * Put in place new policies and requirements for reporting, accepting, and publishing SCAMPI appraisals. * Published clarifying communications on CMMI Level 4-5 interpretation and implementations. * Instituted increased system of scrutiny for appraisal submissions and audited all maturity/capability levels 4 and 5 appraisals. * Fielded- "Understanding CMMI High Maturity Practices" course. *Continued to expand the SEI Partner Network to leverage CMMI transition around the world; there are currently 339 licensed SEI Partners for CMMI-DEV and 34 for CMMI-ACQ. *The SEI completed the development and began delivery of the second course in its series adapting Six Sigma methods to software and systems engineering. Designing Products and Processes using Six Sigma (DPPSS) has been delivered as a public offering and onsite including deliveries to high maturity Air Force organizations. * Developed Instructor Training for DPPSS. *Delivered several tutorials on CMMI and Lean Six Sigma to Army organizations as part of the Army Strategic Software Improvement Program. * Supported Hill AFB adoption of SEI six sigma courses. * Conducted two offerings in the CMMI High Maturity Measurement & Analysis Workshops series. *Created new licensing opportunities for the Improving Process Performance using Six Sigma course, which aims to increase transition to the broader community. * Published "A Study Into the Use of DAES-SARS Information for Forecasting Program Performance," "Requirements and Their Impact Downstream" and "Can You Trust Your Data?" * Provided survey design and analytical expertise to NDIA-sponsored study on system engineering effectiveness; results of this work are documented in "A Survey of Systems Engineering Effectiveness - Initial Results." <p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> * Improve the efficiency of the CMMI Product Suite's usage in order to increase its utility in all sizes of organizations. 				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> * Maximize the interoperability of multiple CMMI constellations-CMMI for Development and CMMI for Acquisition-due to the blend of activities seen in many DoD and other agencies. * Continue to improve the value and integrity of CMMI appraisals *Support a series of user workshops to define the requirements for a CMMI Version 1.3. * Continue to improve the understanding of and guidance on High Maturity. * Full certification of SCAMPI Lead Appraisers. * Release new packaging of the Intermediate Concepts of CMMI to improve understanding and implementations of CMMI levels 2 and 3 * Increase auditing of Level 2 and 3 appraisals. * Release the CMMI for Services constellation. * Apply Team Software Process-Integrated (TSP-I) in field trials at NAVAIR and Bechtel-Bettis. * Provide a CMMI-Six Sigma certification program. * Pilot the Measurement & Analysis Infrastructure Diagnostic (MAID) method. * Continue to develop the Performance Benchmarking Project. * Conduct a technology refresh that will make the SEIR more valuable to the SEI and community and more efficient to operate. <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> *Continue stewardship functions for CMMI. * Respond to CMMI Steering Group direction on new activities to support user requirements including additional constellations, improvements to appraisals' effectiveness and efficiency, and improved user understandings and implementation. * Release CMMI v1.3, resolving incompatibilities across the existing constellations and improving the definitions of and guidance on the high maturity level Process Areas. *Create specific "how to" methodology or implementation guidance for Six Sigma tools, business case analyses, various computations of expected benefits or returns (e.g., ROI), and other techniques and tools. 				
Technology from Non-Traditional Sources	0.000	4.953	0.000	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p><i>FY 2009 Plans:</i></p> <ul style="list-style-type: none"> - Program plans for a new start with FY 2009 funding were developed to find, evaluate, and experiment with innovative technologies emerging from non-traditional sources. - Competitively recruit 10-15 of the countries best venture capitalists to serve as consultants on innovative technologies emerging from non-traditional sources. - Conduct five workshops/roundtables etc with active participation from the operator and requirements communities to discover private sector technologies (information, electronics, devices) that deliver capability at optimum cost to the warfighter. - Complete a Navy workshop at SPAWAR to define Navy needs for emerging innovative IT/electronic technologies. - Establish a focused effort at NRL to identify and conduct critical experimentation on revolutionary products emerging from non-traditional sources. <p>Effort transferred to Project 783 in 2010 and beyond.</p>				
C. Other Program Funding Summary (\$ in Millions) N/A				
D. Acquisition Strategy N/A				
E. Performance Metrics Strategic Goals Supported: Improve ability to acquire systems; Value to taxpayer; Value to taxpayer. Existing Baseline: Value to Customer; Contract Billings; Performance and Cost review. Planned Performance Improvement / Requirement Goal: Average rating of 4 or higher; All costs are allowable and allocable; Less than 5% of programs unsatisfied. Actual Performance Improvement: 4.33 Actual Performance Metric / Methods of Measurement: 1-5 Comment: A&S Performance Measures for Products				

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Customer Supported Activity Performance Requirement Performance Measure Method of Measurement SEI Admin Agent Ensure value to PWS Customers Average rating of 4 or higher Level of overall performance Paper or electronic survey of customers SEI Admin Agent Contract Billings All costs are allowable and allocable Contract costs Approval by ACO Performance and Cost Review Less than 5% of solicited programs Number of unsatisfactory ratings DCAA conducts periodic review For SIS: PM Ensure valuable assistance to programs' success Provide actionable and effective recommendations to PMs Percentage of recommendations implemented Customer Satisfaction Survey to PMs Cost avoidance realized as result of implementing recommendations Interview w/PM as follow-up to Survey		

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P783: Software Producibility Initiative	3.021	3.016	7.537						Continuing	Continuing

A. Mission Description and Budget Item Justification

The role of the Software Producibility in major Defense acquisition programs has been steadily increasing. Much of the mission functionality demanded from programs such as F/A-22, JSF, Future Combat System, and many others is embodied in large, complex software systems. Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromises. These shortcomings can frequently be traced to underpowered software development technologies not up to the task of developing the scale and complexity of software needed. Despite the large role of the commercial sector in advancing software technology, there are many key aspects of complex, distributed, robust systems crucial to DoD that are not being addressed directly by commercial technology efforts, as our experience over the past decade shows.

This initiative will conduct integrated program of research from basic through dem-val that advances the state-of-the art in produceability of software for DoD systems, particularly those systems characterized by high complexity, need for robustness, information assurance, real-time performance, and physical distribution. Research and transition efforts will pursue technical goals to (1) meet and ensure mission-critical requirements; (2) control complexities; (3) enable system evolution; (4) ensure seamless interoperability; and (5) model behavior and performance.

Invest in promising software technologies involving (1) specification of complex requirements; (2) correct-by-construction software development; (3) composable and customizable frameworks; (4) high-confidence system software and middleware; (5) system architectures for network-centric environments; (6) technologies for testing, verification, and validation, and (7) modeling and metrics. Additionally, software and systems development researchers would serve as experts to advise ongoing acquisition programs.

Private sector investment has created rapid advances in technology primarily in information technology and related electronic components and devices. Obtaining an early, accurate understanding of the technological advances that are emerging from small, innovative companies has been problematic for the Department of Defense (DoD) due to these types of companies either overlooking or even avoiding federal sales opportunities. Further, once such innovative technologies become commercially available they can be rapidly obtained by insurgents for terrorist actions. DoD needs opportunities to discover emerging technologies, evaluate their potential to fit DoD needs, and where appropriate conduct critical tests of the components or software under DoD conditions. Facilitating early interactions and meaningful information exchanges between the innovative companies and DoD users will accelerate the application of emerging technical solutions to DoD needs, reduce development costs, and avoid potentially disastrous technological surprises from insurgent use of such new technology. Based on workshops and interactions with these companies and the DoD acquisition community in 2007 and 2008, the need emerged for funding to support rapid evaluation and test of these technologies that can't be accommodated by the normal acquisition program budget process.

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p>Software Producibility</p> <p>This initiative will conduct integrated program of research from basic through dem-val that advances the state-of-the art in produceability of software for DoD systems, particularly those systems characterized by high complexity, need for robustness, information assurance, real-time performance, and physical distribution. Research and transition efforts will pursue technical goals to (1) meet and ensure mission-critical requirements; (2) control complexities; (3) enable system evolution; (4) ensure seamless interoperability; and (5) model behavior and performance.</p> <p>Invest in promising software technologies involving (1) specification of complex requirements; (2) correct-by-construction software development; (3) composable and customizable frameworks; (4) high-confidence system software and middleware; (5) system architectures for network-centric environments; (6) technologies for testing, verification, and validation, and (7) modeling and metrics. Additionally, software and systems development researchers would serve as experts to advise ongoing acquisition programs.</p> <p><i>FY 2008 Accomplishments:</i> Awarded the Software and Systems Test Track. Awarded effort to United Technologies Research Corporation to investigate application of mathematical tools from DARPA DYNARUM program to networked systems to predict formerly unanticipated emergent systems behaviors. Released initial BAA for a Software and Systems Stockroom to improve industrial base performance by providing focused technical capabilities (reuse libraries, abstraction toolsets populated with domain-specific knowledge). Monitored ongoing efforts with Vanderbilt U and UC Berkeley.</p> <p><i>FY 2009 Plans:</i> Continue execution of the Software and Systems Test Track. Complete 2007 research efforts in developing technologies for interoperable systems of systems. Mature business plan for gov/industry co-investment in research, select an implementation approach, initiate the necessary agreements. Mature the SIS Producibility Technology Roadmap, get community consensus on priorities and measures. Promote and monitor usage of the Systems and Software Test Track to provide a place (possibly</p>	3.021	3.016	2.966	

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Exhibit R-2a, PB 2010 Office of Secretary Of Defense RDT&E Project Justification			DATE: May 2009	
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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p>virtual and not a single physical location) for experimental verification of Software-Intensive Systems Producibility technologies due to their novelty and the potential complexity of the underlying theories. The experimental platforms will incorporate software technology to instrument, monitor and test large-scale applications. The experimental platform research included subtasks to conduct large-scale coordination experiments, and developed methods and tools for evaluating aggregate performance of applications. This environment provided a full range of collaborative technology challenges, run-time platforms and applications, experiments, evaluations, and demonstrations. A Common infrastructure will enable control and data flow between both kinds of application components for a distributed environment. The open experimentation environment provided the fundamental reference architecture and underpinnings helping researchers to develop and test their designs as well as facilitates transition of promising technologies into production use. Initiated a research topic in interoperability to address software techniques to improve system of system interoperability. Review previously awarded contracts to develop and transition new methodologies, tools, technologies and techniques that improve DoDs ability to acquire software for large, net-centric warfighting systems of systems. Release a BAA with subsequent award for community based technology efforts such as reuseable SW library or populating existing toolsets with domain-specific knowledge for application to a DoD-specific need such as military avionics, communications, or platform control.</p> <p><i>FY 2010 Plans:</i> Initiate 2-3 new efforts based on mature technology roadmap. Sustain experimentation on the Software and Systems Test Track. Continue DoD-specific community based technology effort awarded in 2008.</p>				
<p>Technology from Non-Traditional Sources</p> <p>Transferred from P781 in FY2010 and beyond</p> <p><i>FY 2010 Plans:</i></p> <ul style="list-style-type: none"> - Conduct five workshops/roundtables etc with active participation from the operator and requirements communities to discover private sector technologies that deliver capability at optimum cost to the warfighter. - Complete evaluation of emerging technologies that deliver capability for SOCOM. 	0.000	0.000	4.571	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<ul style="list-style-type: none"> - Develop tracking system to monitor transfer of emerging technologies from non-traditional sources into DoD. - Develop and issue a report on the transfer of emerging technologies into the DoD. 				
C. Other Program Funding Summary (\$ in Millions) N/A				
D. Acquisition Strategy N/A				
E. Performance Metrics Strategic Goals Supported: Improve ability to acquire systems; Value to taxpayer; Value to taxpayer. Existing Baseline: Value to Customer; Contract Billings; Performance and Cost review. Planned Performance Improvement / Requirement Goal: Average rating of 4 or higher; All costs are allowable and allocable; Less than 5% of programs unsatisfied. Actual Performance Improvement: 4.33 Actual Performance Metric / Methods of Measurement: 1-5 Comment: A&S Performance Measures for Products Customer Supported Activity Performance Requirement Performance Measure Method of Measurement SEI Admin Agent Ensure value to PWS Customers Average rating of 4 or higher Level of overall performance Paper or electronic survey of customers SEI Admin Agent				

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<p>Contract Billings All costs are allowable and allocable Contract costs Approval by ACO Performance and Cost Review Less than 5% of solicited programs Number of unsatisfactory ratings DCAA conducts periodic review For SIS: PM Ensure valuable assistance to programs' success Provide actionable and effective recommendations to PMs Percentage of recommendations implemented Customer Satisfaction Survey to PMs Cost avoidance realized as result of implementing recommendations Interview w/PM as follow-up to Survey</p>		

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