Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*				R-1 ITEM NOMENCLATURE PE 0603781D8Z: *Software Engineering Institute (SEI)*							
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	28.319	30.910	30.424	-	30.424	30.881	31.471	32.133	33.076	Continuing	Continuing
P781: *Software Engineering Institute (SEI)*	21.242	23.294	23.007	-	23.007	23.377	23.897	24.480	24.979	Continuing	Continuing
P783: *Software Producibility Initiative*	7.077	7.616	7.417	-	7.417	7.504	7.574	7.653	8.097	Continuing	Continuing

A. Mission Description and Budget Item Justification

Software is key to meeting the Department of Defense's (DoD's) increasing demand for high-quality, affordable, and timely national defense systems. Systemic software issues are significant contributors to poor program execution, and reliance on software-intensive mobile and net-based products and systems has been increasing (e.g., Joint Tactical Radio System, DDG-1000, Joint Strike Fighter, F-22, and Army Modernization). As stated in the 2010 National Research Council of the National Academy of Sciences report entitled Critical Code, "It is dangerous to conclude that we are reaching a plateau in capability and technology for software producibility." The report notes that software is "…unconstrained by traditional physical engineering limitations…" and what we can accomplish is derived "…from [the] human intellectual capacity to conceptualize and understand systems…." With growing global parity in software engineering, the DoD must maintain leadership to avoid strategic surprise. The Software Engineering Institute (SEI) Program Element (PE) addresses the critical need to research, develop, and rapidly transition state-of-the-art technology and best practices to improve the engineering, management, fielding, evolution, and acquisition of software-intensive DoD systems. The SEI PE's program of work seeks to coordinate across the Department and the Services and leverages expertise in industry and academia to enable the development of Joint capabilities.

Software is more pervasive than ever, and computer programs are growing in size and complexity. Designing, managing, and securing integrated and large-scale mission-critical systems are abilities that the DoD and Defense Industrial Base (DIB) have not yet been mastered. P781 of this PE funds the SEI Federally Funded Research and Development Center (FFRDC). The SEI FFRDC is an institute which enables the exploitation of emerging software technology by bringing engineering, management, and security discipline to software acquisition, development, and evolution, focusing on software technology areas judged to be of the highest payoff in meeting defense needs.

Private sector investment has created rapid advances in information technologies, but the pace of transition to DoD applications is often very slow or the commercial applications do not meet DoD-unique needs (e.g., high assurance software or large scale integrated systems). The DoD needs to create opportunities to discover emerging technologies, to evaluate their potential to fit DoD needs, and, where appropriate, conduct critical tests of the technologies under DoD conditions. P783 of this PE includes the Software Producibility Initiative and Technology from Non-Traditional Sources (TNTS) Initiative. The Software Producibility Initiative seeks to research and transition software science and tools to model and evaluate the performance and control complexities of software-intensive systems. It also seeks to improve the design and sustainment of those systems. The TNTS Initiative seeks to facilitate early interactions between innovative companies and DoD users to accelerate the application of emerging technical solutions addressing DoD needs, reduce development costs, avoid technological surprise, and understand how commercial developments impact DoD programs.

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	**R-1 ITEM NOMENCLATURE** PE 0603781D8Z: *Software Engineering Institute (SEI)*

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	31.298	30.910	31.252	-	31.252
Current President's Budget	28.319	30.910	30.424	-	30.424
Total Adjustments	-2.979	-	-0.828	-	-0.828
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-1.750	-			
• SBIR/STTR Transfer	-0.928	-			
• Other Program Adjustments	-0.301	-	-	-	-
• Defense Efficiency - Reports, Studies, Boards and Commissions	-	-	-0.785	-	-0.785
• Economic Assumptions	-	-	-0.043	-	-0.043

Change Summary Explanation

Defense Efficiency – Report, Studies, Boards and Commissions. As part of the Department of Defense reform agenda, reflects a reduction in the number and cost of reports, studies, DoD Boards and DoD Commissions below the aggregate level reported in the previous budget submission.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Office of Secretary Of Defense			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603781D8Z: *Software Engineering Institute (SEI)*	PROJECT P781: *Software Engineering Institute (SEI)*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
P781: *Software Engineering Institute (SEI)*	21.242	23.294	23.007	-	23.007	23.377	23.897	24.480	24.979	Continuing	Continuing

A. Mission Description and Budget Item Justification

The SEI FFRDC was established in 1984 as an integral part of the DoD's initiative to identify, evaluate, and transition high-leverage software engineering technologies and practices. The SEI grows unique software research and program support capability in a space where the Defense Industrial Base (DIB) and academia cannot as readily address challenges. The mission of the SEI is to provide technical leadership and innovation through research and development to advance the practice of software engineering and technology in support of DoD needs. The Center works across government, industry, and academia to improve the state of software engineering from technical, acquisition, and management perspectives; engages in applied research and development of critical software technologies and tools, and collaborates with the larger software engineering research community; facilitates rapid, value-added transition of software engineering technologies into practice; and evaluates and calibrates emerging software engineering technologies to determine their potential for improving the development and evolution of software-intensive DoD systems. Since its inception, the SEI has helped to transform the fields of software engineering and acquisition, network security, real-time systems and software/system architecture and construction, and software engineering process management.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: ACQUISITION PRACTICES FOR DOD SOFTWARE INTENSIVE SYSTEMS - ACQUISITION SUPPORT PROGRAM (ASP)	2.324	1.973	1.810
Description: ASP develops, delivers, and codifies solutions from state-of-the-art research to affect acquisition challenges in a preventative, pro-active, and systematic manner to provide enduring performance impact to programs across the DoD and Intelligence Community (IC). ***FY 2010 Accomplishments:*** • Published twelfth Acquisition Archetype, "Shooting the Messenger," and completed two additional publications based on investigating recurring causes of failure in DoD programs. • Pursued the establishment of an SEI Acquisition Excellence Knowledge Base and collected software acquisition knowledge assets for broader collaboration and learning in areas such as agile methods, Request for Proposal (RFP) language, and acquisition strategy. • Developed e-Learning modules based on researched DoD needs including "Using Agile in DoD Acquisition." • Completed an analysis of service oriented architecture (SOA) issues and codified these in "Documenting SOA using the Views and Beyond Approach." • Developed two Mission Success in Complex Environments (MSCE) courses including Practical Risk Management and Mission Diagnostics Protocol; introduced research in supply chain management, software assurance, and software security measurement. ***FY 2011 Plans:***			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
• Extend the SEI Acquisition Excellence Knowledge Base to include performance metrics and explore opportunities to collaborate with system integrator practitioners and other DoD knowledge centers. • Research and identify common reasons for software system acquisition failure and disseminate findings to DoD acquisition programs. • Develop new courseware, publications, and collaboration venues to disseminate knowledge and best practices to DoD acquisition programs. • Create derivative works of systems thinking analysis and Acquisition Archetypes to address potential solutions, augment training, and advance the state of practice in software engineering, systems engineering, and software and systems DoD acquisition. ***FY 2012 Plans:*** • Discover gap areas in DoD acquisition and software knowledge and practices, and incorporate these into research agendas to develop needed capabilities. • Create new and unique knowledge assets in the Acquisition Excellence Knowledge Base, targeting the needs of the acquisition workforce (senior executives and below).			
Title: SOFTWARE ENGINEERING TECHNICAL PRACTICES - NETWORKED SYSTEMS SURVIVABILITY PROGRAM (NSS) ***Description:*** NSS identifies, develops, matures, and broadly transitions new technologies, system development practices, and system management practices that enable informed trust and confidence in using information and communication technology. This Program houses the Computer Emergency Response Team (CERT), a critical asset which provides DoD and other government and private sector organizations with the information and training necessary to improve the ability to protect information infrastructures from current and emerging threats. NSS's Survivable Systems Engineering (SSE) Initiative develops and adapts practices, tools, techniques, and measures for addressing security and survivability issues in all phases of the development and acquisition lifecycles for software and software-reliant systems. The Assuring Network Dependent Missions (ANM) Initiative concentrates on the bodies of practice, tools, and security technologies that address the dynamics of operational systems, seeking to ensure that fielded systems meet their survivability requirements as vulnerabilities and threats evolve. ***FY 2010 Accomplishments:*** • Established the CERT Source Code Analysis Labs (“SCALe”) to perform certifications to satisfy the demand for source code assessments in support of DoD acquisition decision making. • Developed and executed a Tactical Response and Analysis Challenge training exercise as a part of the Office of the Secretary of Defense’s Network and Information Integration (OSD/NII) International Cyber Defense Workshop. • Installed and configured the CERT Exercise Network (XNET) in the U.S. Army Reserve Information Operations prototype range environment.	3.466	6.380	6.235

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
• Completed and published the CERT-Resiliency Management Model (CERT-RMM) technical report and developed a CERT-RMM appraisal method. • Released a new version of the System for Internet Level Knowledge (SILK), a collection of security event analysis tools that detect problems not detected by commercially available intrusion detection tools. • Developed and released Security Quality Requirements Engineering (SQUARE) tools with the Carnegie Mellon University Masters of Software Engineering team. • Developed a static analysis tool checker for C++ and Java to help assure key security properties in mission-critical software-reliant networked systems. ***FY 2011 Plans:*** • Explore emerging software and hardware-based approaches for establishing trusted transactions to significantly improve networked systems security and enterprise resiliency. • Provide a proof-of-concept demonstration of trusted application operations in a known compromised environment. • Develop secure coding standards for mission-critical software-reliant acquisition for C++ and Java and transition to international standards bodies. • Develop and pilot a prototype a Secure Mission Assurance Diagnostic Method and software security measures identification method. • Improve Cyber Mission Assurance (CMA) through measurement by developing a framework and CMA metrics to enable data-driven decision-making. • Develop and pilot a framework and new metrics for measuring resiliency in mission-critical software-reliant networked systems. • Develop system dynamics models of insider threat based on findings from the analysis of actual cases and begin to develop a prototype for DoD and other government and private sector organizations to measure insider threat risk based on exposure. ***FY 2012 Plans:*** • Pilot methods for identifying and selecting software security measures and measurement processes. • Conduct research needed to prepare acquirers, managers, developers, and operators of mission-critical software-reliant networked systems to address security and survivability throughout the design and acquisition life cycles to enable better risk assessment and mitigation. • Develop and transition highly specialized tools and practices that address challenges across the spectrum of network operations, incident response, and mitigation to reduce the opportunity for, and impact of, cyber attacks.			
Title: SOFTWARE ENGINEERING TECHNICAL PRACTICES – RESEARCH, TECHNOLOGY, AND SYSTEM SOLUTIONS PROGRAM (RTSS)	12.085	13.284	13.378

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: RTSS performs research focusing on the structure and behavior of software-reliant acquisition systems and provides the technical foundations, methods, practices, and solutions that enable assured and flexible system capabilities at all scales. RTSS's Architecture Centric Engineering (ACE) Initiative creates, matures, pilots, and transitions technical foundations and practices for developing and evolving mission-critical software-reliant acquisition systems at all scales to ensure conformity to their architectures. The System of Systems Practices (SoSP) Initiative is dedicated to the effective integration and interoperation of distributed systems that must work together in net-centric operations and SoS environments. The System of Systems Software Assurance (SoSSA) Initiative aims to reduce the amount of time and effort required to achieve technically justified confidence that SoSs will behave acceptably in their actual environments of use. ***FY 2010 Accomplishments:*** • Developed a theoretical framework that applies economic-and architecture-based analyses for evaluating architecture evolution paths to significantly improve the quality of a system evolution effort. • Developed linear decision diagrams, which represent a significant advance in static analysis and model checking, particularly in the case of control-intensive numeric programs, such as avionics mission computing systems and shipboard combat systems. • Explored techniques for addressing architectural challenges and risks throughout the development lifecycle and created a pilot-ready method for use in DoD acquisition systems. • Developed concept demonstrations for experiments related to quality of service (QoS) for mobile, wireless networks and bandwidth allocation for Unmanned Aerial Vehicles (UAVs). • Completed and published research on testing in service-oriented environments, such as the US Navy's Consolidated Afloat Networks and Enterprise Services (CANES) program. • Developed the Service Migration and Reuse Technique Enterprise Service Portfolio (SMART-ESP) method, which provides a systematic way for DoD organizations to identify potential services from across an enterprise portfolio – an important early step in a successful Service-Oriented Architecture (SOA) migration. • Completed and published a case study on system of systems (SoS) interoperability challenges and promising approaches. • Completed research on the impact of software on the overall reliability of mission-critical software-reliant acquisition systems. ***FY 2011 Plans:*** • Develop a reliability framework, new scheduling algorithms for real-time multi-core platforms, architecture-based testing strategies, and scalable static analysis capabilities that is designed for us in mission-critical software-reliant acquisition systems. • Extend quality attribute analysis to dynamic settings and demonstrate a comprehensive framework for developing DoD cyber-physical systems, such as avionics mission computing systems or shipboard combat systems. • Develop an initial set of SoS architecture patterns and demonstrate an approach for blending architecture-centric and agile techniques.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
• Demonstrate the synergistic use of quantitative and qualitative methods for large-scale system design, analysis, construction, and evolution. • Demonstrate concepts that will enable the design and analysis of ultra-large scale (ULS) acquisition systems from a socio-technical point of view. • Demonstrate the ability to use ULS acquisition system architectures for predictably satisfying ULS system quality attributes. • Develop SoS engineering principles and frameworks in the areas of security and federated identity management in constrained environments, data interoperability, and other technical challenge areas for DoD SoS implementations. • Define principles for the successful use of cloud computing, service and infrastructure versioning, context-aware applications, and other emerging SoS technologies in DoD SoS implementations, and instantiate and analyze the effectiveness of SoS technologies in DoD acquisition programs. • Develop principles for determining which assurance activities and arguments contribute most to obtaining justified confidence in mission-critical software-reliant acquisition system behavior. • Investigate the types of commitments that lead to fragile or more robust and desirable SoS behavior, types of defects in the commitments that lead to unacceptable SoS outcomes, and methods for evaluating the impact of failing to live up to the commitments in the context of DoD acquisition systems. ***FY 2012 Plans:*** • Continue to research the effective integration and interoperation of distributed systems that must work together in network-centric operations and SoS environments, and transition integrated methods and practices that reduce the time to assure acceptable DoD acquisition system behavior. • Investigate and develop software environment support for establishing, maintaining, and monitoring the use of consistent architecture patterns across SoS constituents to simplify and speed up integration processes. • Continue to investigate and apply architectural principles to DoD cyber-physical systems, such as resource management and reliability. • Develop a general framework for analyzing the interactions between the human and computational aspects of ULS systems.			
Title: SOFTWARE ENGINEERING MANAGEMENT PRACTICES – SOFTWARE ENGINEERING PROCESS MANAGEMENT PROGRAM (SEPM) ***Description:*** SEPM identifies, matures, and transitions proven process management practices and performance improvement and measurement techniques for software and related disciplines in support of the management, development, and acquisition of current and future software, systems, and services. SEPM's Capability Maturity Model Integration (CMMI) Initiative offers a systematic, well-understood, model-based approach to capability development for software-enabled systems and services, and a means to improve the delivery of needed products and services. The Software Engineering Measurement and Analysis	3.367	1.657	1.584

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
(SEMA) Initiative provides practical guidance and expertise in measurement and analysis to support management, engineering, acquisition, and services. The Research into Performance Measurement and Analytical Methods (RPMAM) Initiative conducts research to improve data quality, analysis, and extraction and to ensure that benefit and value is realized from investments in large data repositories, as well as addresses the use of probabilistic methods for improved accuracy in the development of early system cost estimates. ***FY 2010 Accomplishments:*** • Completed development of the CMMI v1.3 models and appraisal methods, resolving incompatibilities across the existing constellations and improving the definitions of and guidance on the high maturity level Process Areas. • Completed Version 1.0 of the CMMI Upgrade Training for the CMMI Development constellation. • Completed study showing new evidence about effective implementations of CMMI in the defense industrial base and in the DoD. • Published the Measurement and Analysis Infrastructure Diagnostic (MAID) Evaluation Criteria and Method Description Document and completed pilot trials. • Published reports summarizing survey results and workshops on CMMI High Maturity Measurement and Analysis techniques and impacts. • Published a CMMI/Six Sigma Body of Knowledge. ***FY 2011 Plans:*** • Investigate methods to improve the quality of program management data reported to DoD repositories and develop effective data checking rules. • Investigate the use of advanced probabilistic methods to model and better account for the uncertainties and influence of uncontrollable factors in DoD acquisition systems in order to provide better cost estimates. ***FY 2012 Plans:*** • Research and publish models, results, and heuristics for use in analysis, diagnostics, feasibility studies, risk evaluation, and early warning indicators in DoD acquisition systems. • Research methods for more completely identifying the set of stated and unstated needs and requirements for mission-critical software-reliant acquisition systems, with the goal of dramatically reducing requirements volatility and rework. • Continue research into the automated detection of data anomalies. Based on results of FY11 work, broaden the scale and diversity of data types and data objects to be analyzed and assessed for detection of anomalies. • Continue validation studies of research begun in FY11 to investigate use of probabilistic methods for early life cycle cost estimation.			
Accomplishments/Planned Programs Subtotals	21.242	23.294	23.007

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C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

- Transition of tools and practices for use in DoD programs of record and to the DIB, and number of agencies and organizations sponsoring work.
- Number of publications in refereed journals and peer reviewed reports.
- Number of external research collaborations and interactions with the broader software engineering research community.
- Adoption of coding standards and process techniques by standards bodies, working groups, and software/systems engineering organizations.
- Number of training courses and curricula developed to contribute to the growth of capability in the software engineering research and development community and software/system acquisition workforce.
- Development of new scalable technical and software-enabled cyber security approaches that address software assurance and improve enterprise resiliency.
- Reduced number of mission-critical software-reliant acquisition program failures and cost and schedule overruns, as well as quantitative improvements in overall system cost, time to develop, and performance – this will be evidenced by: reductions in time to test software and the amount of rework required; improved ability to articulate software requirements; development of techniques that offer orders of magnitude improvement in software productivity; development of new software algorithms and abstractions; and decreased number of software defects found through application of effective process and software development methods.

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COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
P783: *Software Producibility Initiative*	7.077	7.616	7.417	-	7.417	7.504	7.574	7.653	8.097	Continuing	Continuing

A. Mission Description and Budget Item Justification

Shortcomings in software development often lead to schedule slippage, cost growth, and mission compromise. These shortcomings can frequently be traced to software development technologies which are not capable of addressing the scale and complexity of the software needed in today's systems. The Software Producibility Initiative seeks to conduct an integrated program of research from applied research through demonstration and evaluation to advance the state-of-the-art in the producibility of software for DoD systems, particularly those systems characterized by high complexity, need for robustness, information assurance, real-time performance, and physical distribution. The Initiative maintains a portfolio of work relevant to the Warfighter and DoD needs by periodically evaluating technology development efforts, retiring those that are under performing, and starting new efforts based on a risk-reward priority list.

In addition, obtaining an early, accurate understanding of the technological advances emerging from small, innovative companies has been problematic for the DoD due to these companies often avoiding or failing to notice federal sales opportunities. Redoing work that is being conducted in the private sector does not effectively utilize resources. The TNTS Initiative identifies and selectively funds experimentation with innovative, emerging technologies to evaluate their potential for DoD application, with the ultimate goal of accelerating the delivery of capabilities to the Services and the Warfighter.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: SOFTWARE PRODUCIBILITY INITIATIVE	2.772	3.164	7.417
Description: The Software Producibility Initiative seeks to improve the DoD's ability to design, build, test, and sustain software-intensive systems which meet mission critical requirements, exhibit predictable behavior, and enable evolution and interoperability. Technology thrust areas include specification of complex requirements; "correct-by-construction" software development; scalable composition; high-confidence software and middleware; system architectures for network-centric environments; technologies for system visualization, testing, verification, and validation; and model-driven development approaches. Performers include Army Communications Electronics Research Development and Engineering Center (CERDEC), Army Research Laboratory (ARL), Naval Research Laboratory (NRL), Space and Naval Warfare Center (SPAWAR), and Air Force Research Laboratory (AFRL), as well as university and industry collaborators.			
FY 2010 Accomplishments: • Developed a prototype visualization canvas for understanding large systems (10+ million lines of code) which works at multiple system levels; tool was employed by CISCO to refactor Internetwork Operating Systems (IOS) dependencies and has been adopted by the commercial CodeSonar product and the Navy/OSD Small Business Innovation Research (SBIR) program. • Developed a mathematically rigorous interface formalism that helps to ensure correct composition of components developed independently.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
• Developed an end-to-end modeling and simulation environment to experiment with and analyze SOAs on Mobile Ad-hoc Networks (MANETs) and integration technologies for testing real network applications with the simulated networks. • Showed applicability of existing dynamical systems techniques for uncertainty quantification in software systems, and increased simulation speeds by 10-100x. • Developed a collaboration environment that houses over two dozen challenge problems which span challenges such as multi-core, deployment optimization, embedded systems, and software evolution; effort spawned a new technology insertion experiment intended for transition to current aircraft programs as well as a collaboration with the National Science Foundation's Cyber Physical Systems-Virtual Organization. • Developed preliminary theories and algorithms for extracting Behavioral Type Signatures in C-based components to facilitate trustworthy integration of independently developed software components. ***FY 2011 Plans:*** • Continue enhancements to the visualization prototype, and release an architectural visualization product suite bundled with code analysis tools to support effective development of large software systems; transition to large DoD programs. • Leverage the interface formalism to broaden the range of composition errors that can be prevented and facilitate definition of interfaces by software developers to enable earlier detection of errors and problems that often only emerge during system integration. • Pursue instantiations of the collaboration environment with the Air Force Cyber Innovation Center and integration with Software Engineering Institute research programs, and grow the user community to enable more systematic transition and validation of systems and software engineering technologies. • Develop a prototype tool for demonstrating how to correctly compose software components in reactive software systems, allowing for concurrent engineering and component reuse. • Develop a basic capability to graphically compose scalable system software that runs on machines ranging from laptops and multi-core workstations to supercomputers. • Create a working prototype that extends code coverage analysis to binary (object code) to enable detection and defense against attacks and provide the ability to analyze applications without their source. ***FY 2012 Plans:*** • Develop open source demonstration tools enabling the specification of interface formalisms, definition of component interfaces, and the checking of component composition. • Perform a use-case demonstration of the graphical drag-and-drop scalable software development framework to show support of collaborative design, development, test, evaluation, and optimization of complex DoD systems-of-systems software, resulting in scalable systems, faster development, software reuse, and lower life-cycle costs.			
Title: TECHNOLOGY FROM NON-TRADITIONAL SOURCES (TNTS) INITIATIVE	4.305	4.452	-

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Description: The TNTS Initiative utilizes workshops and direct interaction with DoD users to identify needs and relevant emerging private solutions, and provides experimentation funds for promising technologies to allow for limited, DoD-internal buy-and-try experimentation money to aid in procurement decisions. Experimentation sponsors include the National Security Agency, Office of Naval Research, AFRL, Air Force Materiel Command Electronic Systems Center (AFMC ESC), CERDEC, SPAWAR, U.S. Marine Corps, and U.S. Coast Guard. ***FY 2010 Accomplishments:*** • Conducted thorough technical reviews of 260 companies with innovative and emerging products that could be useful to the DoD. Introduced CERDEC, Air Force Electronics Systems Center and National Security Agency representatives to 68 companies with the most promising solutions to stated operational needs. • Provided experimentation funding to evaluate promising capabilities in: protection of internal resources from web attacks; ultra-wideband antenna for ground and unmanned airborne platforms; data acceleration tool; integrated Ultra-High Frequency (UHF) Radio Frequency Identification (RFID) reader/antenna system; network administrator's monitoring; and digital TV signals as a non-Global Positioning System (non-GPS) navigation tool. The evaluations for each of these efforts will be completed in FY11 with operational users from Army CERDEC and AFMC ESC ready to incorporate the most successful capabilities. • Experimentation with SPAWAR and the IC resulted in operational deployment of new capabilities in on-line collaboration for improved internal communications and planning, and malware detection and remediation. ***FY 2011 Plans:*** • Conduct thorough technical reviews of 16 companies with innovative and emerging products that could be useful for technology forecasting for Office of the Director, Defense Research and Engineering (DDR&E). • Conduct 3-5 additional workshops to define needs and provide innovative emerging technology solutions. Host organizations for the workshops include the Office of the Deputy Assistant Secretary of the Navy (Energy), the United States Marine Corps Warfighting Laboratory (MCWL), and the Defense Intelligence Agency (DIA) • Provide experimentation funding to organizations hosting workshops (see above) for the evaluation of 10-15 innovative emerging technology products that deliver capabilities at optimum cost to the warfighter. ***FY 2012 Plans:*** The TNTS Initiative will be moved from P783 under the SEI PE to P832 under the Quick Reaction Special Projects PE (0603826D8Z) in FY 2012 and beyond.			
Accomplishments/Planned Programs Subtotals	7.077	7.616	7.417

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APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 3: *Advanced Technology Development (ATD)*	R-1 ITEM NOMENCLATURE PE 0603781D8Z: *Software Engineering Institute (SEI)*	PROJECT P783: *Software Producibility Initiative*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

• Number of open source tools developed which enable the specification of interface formalisms, the definition of component interfaces, and the checking of component composition.
• Demonstrable reduction in the number of vulnerabilities and errors detected in software code due to an improved ability to visualize and execute large software systems as compared to the state of the practice.
• Number of transitions of promising systems and software engineering technologies to the DoD and DIB, and successful adoption of technologies by early adopter partners.
• Number of successful deployments in operational contexts of emerging technologies from small, innovative companies.
• Observed improvements in cost, schedule, and performance via advances in the producibility of software for complex DoD systems and the productivity of software developers.
• Number of multiple, active collaborations achieved between Software Producibility performers and the broader software engineering research community.
• Number of synergies/coordination/Joint activities across research efforts.