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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense	DATE: February 2011
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APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 3: <i>Advanced Technology Development (ATD)</i>				PE 0603670D8Z: <i>Human Social Culture Behavior (HSCB) Modeling Advanced Development</i>							
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	9.761	11.510	18.179	-	18.179	20.743	21.150	21.603	22.252	Continuing	Continuing
P370: <i>Human Social Culture Behavior (HSCB) Modeling Advanced Development</i>	9.761	11.510	18.179	-	18.179	20.743	21.150	21.603	22.252	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program is focused on demonstrating general-use, cross-domain capabilities/tools to support all Human Social Culture Behavior (HSCB) application areas. It will support advanced technology development in four areas: computational modeling capabilities; visualization software toolsets; training/mission rehearsal systems that provide forecasting capabilities for socio-cultural responses at the strategic, operational and tactical levels; and tools for improved data collection and functional architectures for managing and disseminating socio-cultural data, information and analysis products. The resulting technologies will provide: 1) cultural understanding/overlays in existing intelligence, influence operations, and operations planning systems; and 2) training and mission rehearsal capabilities that go beyond strategic level planning tools (to the operational and tactical levels), providing broader, more in depth training/retention capability. A technical assessment capability will be established across all program line items as a means for identifying discrete and discriminating new technologies as they are developed. Research will result in modeling capabilities that generate and technically demonstrate validated adversaries to populate "what if" analyses for forecasting reactions of a defined class of adversaries to U.S./coalition actions; demonstration of strategic decision making tools that highlight political, religious, cultural, and related factors; training/mission rehearsal systems capable of using flexible underlying cultural models to train at the operational/tactical level; integration and demonstration of social, cultural and human behavior/cognition skills training systems for operational and strategic planning personnel in a coalition force context; visualization software toolsets that can be used as strategic decision making tools to account for political, religious, cultural, and other factors.

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APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 ITEM NOMENCLATURE PE 0603670D8Z: <i>Human Social Culture Behavior (HSCB) Modeling Advanced Development</i>
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B. Program Change Summary (\$ in Millions)	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012 Base</u>	<u>FY 2012 OCO</u>	<u>FY 2012 Total</u>
Previous President's Budget	10.395	11.510	19.187	-	19.187
Current President's Budget	9.761	11.510	18.179	-	18.179
Total Adjustments	-0.634	-	-1.008	-	-1.008
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-0.374	-			
• SBIR/STTR Transfer	-0.244	-			
• Other Program Adjustments	-0.016	-	-	-	-
• Defense Efficiency - Reports, Studies, Boards, and Commissions	-	-	-0.982	-	-0.982
• Economic Assumptions	-	-	-0.026	-	-0.026

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.

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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 0603670D8Z: Human Social Culture Behavior (HSCB) Modeling Advanced Development				PROJECT P370: Human Social Culture Behavior (HSCB) Modeling Advanced Development			
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
P370: Human Social Culture Behavior (HSCB) Modeling Advanced Development	9.761	11.510	18.179	-	18.179	20.743	21.150	21.603	22.252	Continuing	Continuing
A. Mission Description and Budget Item Justification											
This program is focused on demonstrating general-use, cross-domain capabilities/tools to support all Human Social Culture Behavior (HSCB) application areas. It will support advanced technology development in four areas: computational modeling capabilities; visualization software toolsets; training/mission rehearsal systems that provide forecasting capabilities for socio-cultural responses at the strategic, operational and tactical levels; and tools for improved data collection and functional architectures for managing and disseminating socio-cultural data, information and analysis products. The resulting technologies will provide: 1) cultural understanding/overlays in existing intelligence, influence operations, and operations planning systems; and 2) training and mission rehearsal capabilities that go beyond strategic level planning tools (to the operational and tactical levels), providing broader, more in depth training/retention capability. A technical assessment capability will be established across all program line items as a means for identifying discrete and discriminating new technologies as they are developed. Research will result in modeling capabilities that generate and technically demonstrate validated adversaries to populate "what if" analyses for forecasting reactions of a defined class of adversaries to U.S./coalition actions; demonstration of strategic decision making tools that highlight political, religious, cultural, and related factors; training/mission rehearsal systems capable of using flexible underlying cultural models to train at the operational/tactical level; integration and demonstration of social, cultural and human behavior/cognition skills training systems for operational and strategic planning personnel in a coalition force context; visualization software toolsets that can be used as strategic decision making tools to account for political, religious, cultural, and other factors.											
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2010	FY 2011	FY 2012	
Title: Modeling Capabilities								3.416	4.029	6.335	
Description: Generation and technical demonstration of validated synthetic adversaries driven by underlying HSCB computational models will be the key to "what if" analyses for forecasting reactions to U.S./coalition military, economic, or political actions for defined classes of adversaries. Integrate and demonstrate decision making support tools useful within programs of record and operational user analysis, planning and execution systems for political, religious, cultural and other factors. Develop tools and software products to integrate socio-cultural models and information into existing intelligence, training, operational planning, and Command and Control systems. Support specific operational planning tasks for selected government partners via limited technical demonstration in user settings and by leveraging: other models; work performed in visualization; cultural understanding; the development of specific and generalized cultural models. In addition, working with operational partners HSCB models will be tested in realistic environments by representative users.											
FY 2010 Accomplishments:											

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
<p>Successfully integrated a rule-based probative reasoner (PRIME) and an agent based simulation (MADNeSS) into a single hybrid modeling tool that enables the embedding of socio-cultural reasoning into course of action planning and analysis. Demonstrated ability of the tool to support the Military Decision Making Process (Set Corp). Developed interlinked system dynamics macro-level model and agent-based micro-level simulation for modeling the first- and second-order effects on inter-communal conflict of alternative applications of Diplomatic Infrastructure Military Economic (DIME) actions (specifically informational actions for this proof of concept) available to U.S. military planners (NSI). Completed Phase 1 of an initial model-based prototype tool for supporting influence operations; specifically focusing on target audience analysis, the core operational task to support means-end chaining as a key theoretical and methodological base for building and using computational models for the target audiences (Soar Tech). Integrated HSCB-developed S&T into latest accredited-and-deployed SAVANT/POWER Tool version (Charles River). Supported USPACOM classified modeling effort where game theoretic models (Senturion) are being used to assist in operational decision making. For USSOCOM, modified an influence operations doctrine modeling program to allow interoperability with emerging influence operations models.</p> <p>FY 2011 Plans: Integrate and demonstrate decision making support tools within Planning/Execution/Re-Planning systems, and socio-cultural models and information into existing intelligence, training, operational planning, and Command and Control systems. Demonstrate operationally relevant sentiment and group extraction, and link analysis. Develop and demonstrate tools to determine the second and third order effects of non-kinetic courses of action (COA), including effects on unintended audiences. Identify, simulate, and forecast the interactive effects of kinetic and non-kinetic COA.</p> <p>FY 2012 Plans: Continue research and demonstration of integrated decision making support tools, with particular focus on hybrid modeling to forecast both near and long-term effects of both kinetic and non-kinetic COA. Demonstrate how extracted sentiments and groups support COA development.</p>				
<p>Title: Visualization Software Toolsets</p> <p>Description: This program will demonstrate a first generation decision-making toolset that includes HSCB factors. Visualization software toolsets and integration of a common architecture visualization tool that will be used in operational/strategic decision making is the goal. These tools are required to account for political, religious, cultural, and other factors as well as to vertically integrate cultural information into a military operational environment. Common, generalized (strategic to tactical) tools for visualization of DIME COA, and Political Military Economic Social Information Infrastructure (PMESII) effects on the battlefield, or during Security, Stability, Transition and Reconstruction phases do not exist. HSCB will focus on providing visualization capabilities that support a richer understanding of socio-cultural data in concert with other warfighter data.</p>		2.440	2.709	4.525

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
<p>FY 2010 Accomplishments: Conducted HSCB Geospatial Visualization Analysis and Modeling Workshop that resulted in a robust understanding of how visualization can support strategic, operational, and tactical decision making for today's warfighters. In support of the Joint Military Support Command and the Military Information Support to Operations (MISO) community, transitioned visualization component to SAVANT/POWER Tool. This will result in user-community test/evaluation and demonstrate the transition path provided by SAVANT-HSCB. Implemented prototype model and integration approach (Charles River Analytics).</p> <p>FY 2011 Plans: Complete system design of open source modeling visualization framework architecture, and develop SOA compliant prototype. Demonstrate visualization tool sets that can access underlying geospatial and socio-cultural data, evidentiary information, and associated uncertainty in the same visualization.</p> <p>FY 2012 Plans: Demonstrate visualization methods and tools that can deal with the most challenging visualization issues, including sparse data sets, highly volatile underlying data, and inherent complexity of socio-cultural behavior dynamics.</p>				
<p>Title: Training/Mission Rehearsal Systems</p> <p>Description: Current methods and procedures for integrating cultural information into military operations do not satisfy requirements for ongoing operations. Specifically, they lack flexibility to rapidly deliver just-in-time training for new regions of interest and emerging mission areas (e.g. transition and reconstruction). Training systems capable of using flexible underlying cultural models to train at the operational/tactical level are required. These capabilities when combined with socio-cultural operational planning tools, will allow users to understand the socio-cultural environment. It is then possible to plan, and potentially rehearse non-kinetic actions prior to execution, make changes, and thus tailor outcomes.</p> <p>FY 2010 Accomplishments: Delivered training guide, organized around seven vignettes that describe interactions between American warfighters and Afghans. U.S. Army Special Operations Command, Marine Corps Intelligence Activity and the Marine Corps Center for Advanced Operational Culture Learning are already using the booklet and plan to purchase more (ARA Klein). Successfully demonstrated integration of physical and cognitive modeling, and developed and demonstrated authoring tools to edit scenarios and avatars. Technology in use by components (JFCOM, USAF NCE). Completed Phase 1 of developing culture-general cross-cultural skill training that will help military personnel move more easily into different cultures regardless of proficiency in a given culture. Developed learning objectives, identified the cross-cultural competence skills, and developed 3 scenarios and video vignettes, and instructional materials. The system is fully functional and ready for assessments and further development of content (University</p>		1.953	2.302	3.621

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
<p>of Southern California). Completed design of conversational agents that will interact with trainees based on parameters and rules that instantiate cultural influences on dialogue (Alelo).</p> <p>FY 2011 Plans: Complete a cognitive task assessment that will identify specific cross-cultural competencies that are necessary for a range of military specialties. Emphasize modeling and simulation of human behavior that will support virtual training at the tactical level. Research and develop multi-platform software for delivering socio-cultural and capability use training.</p> <p>FY 2012 Plans: Multiple methodologies for training are employed- virtual, immersive, deployable, live simulation, instructor led. FY 2012 work will focus on researching how these methods can and will be used synergistically for cultural training, helping to determine which methods are most effective for cultural training.</p>				
<p>Title: Socio-Cultural Data Collection and Management</p> <p>Description: Develop and demonstrate tools for improved collection of socio-cultural behavior data, particularly at tactical level and for denied areas. Generate functional architectures for managing and disseminating socio-cultural data, information and analysis products vertically and horizontally within DoD. Develop and demonstrate tools to support ingest of unstructured data and structuring of data for use in computational modeling for intelligence analysis, operations analysis, and decision support.</p> <p>FY 2010 Accomplishments: Developed proof of concept modeling and simulation architecture and successfully integrated additional third party modeling tools and an open source visualization tool. Also demonstrated the ability to perform automated COA analysis and optimization, employing new capabilities, in support of an influence operations use case (Impact Computing). Delivered assessment of data acquisition and transformation to complement the TRADOC/TRISA experiment to capture unconventional warfare and irregular warfare data for modeling and simulation use by complementing the Human Terrain Teams data collection standard and threshold with that of the US Army Special Operations Forces (ARSOF) for the Athena project (ViaGlobal). Designed and inserted semi-automated approaches to tracking socio-cultural sentiments from web sources into the existing BBN Media Monitoring System (MMS). The MMS has been funded by the Combating Terrorism Technical Support Office (CTTSO) Surveillance, Collection and Operations Support subgroup (SCOS) and deployed in more than 17 sites both in the United States and overseas. The sentiment tracking capability was tested with the Special Operations Center, Pacific Command (SOCPAC) and showed significant positive impact on time required to complete analysis (BBN). Built a web-based system, grounded in integrated, semantically annotated knowledge, references and databases that members of the complex operations community can use to answer questions and do</p>		1.952	2.470	3.698

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B. Accomplishments/Planned Programs (\$ in Millions)	FY 2010	FY 2011	FY 2012
modeling/simulation (Milcord). Conducted National Academies Committee on Human-Systems Integration workshop focused on the methods and tools relevant to the subject of Unifying Social Data Frameworks. <i>FY 2011 Plans:</i> Build functional and technical architectures for managing and disseminating data. Demonstrate the utility of semi-automated tools that military personnel with little or no training can use to collect and interpret unstructured socio-cultural behavior data. Develop and demonstrate methods and tools for validating qualitative data. <i>FY 2012 Plans:</i> Research and develop tools for collecting valid socio-cultural data in denied or restricted environments. Develop and demonstrate an integrated set of model description data (metadata), information systems, and procedures that will facilitate assessing the software engineering quality of socio-cultural behavior models, their theoretical foundation and the translation of theory into model constructs.			
Accomplishments/Planned Programs Subtotals	9.761	11.510	18.179

C. Other Program Funding Summary (\$ in Millions)

Line Item	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
• PE 0602670D8Z BA 2: <i>HSCB Applied Research</i>	7.639	8.854	14.858		14.858	17.057	17.432	17.821	18.359	Continuing	Continuing
• PE 0604670D8Z BA 4 : <i>HSCB Research & Engineering</i>	6.295	6.845	10.272		10.272	12.926	13.180	13.440	13.878	Continuing	Continuing

D. Acquisition Strategy

N/A

E. Performance Metrics

N/A

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