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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 0603670D8Z Human, Social and Culture Behaviour Modeling (HSCB) Advanced Development					
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	2.960	9.330	11.480						Continuing	Continuing
P370: Human, Social and Culture Behaviour Modeling (HSCB) Advanced Development	2.960	9.330	11.480						Continuing	Continuing

A. Mission Description and Budget Item Justification

(U) This program is focused on demonstrating general-use, cross-domain capabilities/tools to support all HSCB application areas. It will develop: Computational modeling capabilities; Visualization software toolsets; and Training/mission rehearsal systems that provide forecasting capabilities for socio-cultural (human terrain) responses at the strategic, operational and tactical levels. The resulting technologies will provide, 1) cultural understanding/overlays in existing intelligence, influence operations, and operations planning systems; 2) training and mission rehearsal capabilities that go beyond strategic level planning tools (to the operational and tactical level), providing broader, more in depth training/retention capability. Establishment of a "testbed" capability to provide a forum for model comparison and demonstration.

Modeling Capabilities that will generate and demonstrate validation of synthetic adversaries to populate "what if" analyses for forecasting reactions to a defined class of adversaries to U.S./coalition Strategic decision making tools that account for political, religious, cultural, and other factors. Integration of a common architecture visualization tool that vertically integrates cultural information into a military operational environment.

Visualization software toolsets that will be used as a strategic decision making tool that will account for political, religious, cultural, and other factors. Integration of a common architecture visualization tool that vertically integrates cultural information into a military operational environment.

Training/Mission rehearsal systems capable of using flexible underlying cultural models to train at the operational/tactical level. Integration and demonstrations of social, cultural and human behavior/cognition skills training systems for operational and strategic planning personnel in a coalition force context.

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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	2.974	9.381	11.689	
Current BES/President's Budget	2.960	9.330	11.480	
Total Adjustments	-0.014	-0.051	-0.209	
Congressional Program Reductions				
Congressional Rescissions		-0.051		
Total Congressional Increases				
Total Reprogrammings				
SBIR/STTR Transfer	-0.008			
Other	-0.006		-0.209	

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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
P370: Human, Social and Culture Behaviour Modeling (HSCB) Advanced Development	2.960	9.330	11.480						Continuing	Continuing

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Modeling Capabilities that will generate and demonstrate validation of synthetic adversaries to populate "what if" analyses for forecasting reactions to a defined class of adversaries to U.S./coalition Strategic decision making tools that account for political, religious, cultural, and other factors. Integration of a common architecture visualization tool that vertically integrates cultural information into a military operational environment.

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

	FY 2008	FY 2009	FY 2010	FY 2011
Modeling Capabilities Generation and demonstration of validated synthetic adversaries driven by underlying HSCB computational modals will be the key to "what if" analyses for forecasting reactions to a defined class of adversaries to U.S./coalition military, economic, or political actions.	1.500	3.000	3.948	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p>Integration and demonstration of decision making support tools within Battle Command Planning/ Execution/Re-Planning systems for political, religious, cultural and other factors. Development of tools and software products to integrate socio-cultural models and information into existing intelligence, and Command and Control systems.</p> <p><i>FY 2008 Accomplishments:</i> Integrated, demonstrated, and validated human terrain forecasting computational models that enable examination of 2nd, 3rd, and higher order effects of kinetic and non-kinetic actions within a theater. Current software focused on existing social network modeling tools and relatively data poor/outdated theory based models. This work provided a more robust, generalizable set of DoD centric models to support decision aids and toolsets for command and control, intelligence, influence operations and operational planning.</p> <p>Accomplishments:</p> <ul style="list-style-type: none"> • Developed initial prototype framework for socio-cultural data model assessment. • Categorized multiple modeling efforts focused on understanding attitudes and beliefs, target audience analysis, message dissemination, and other social simulations to support planning. • Conducted a test of advanced modeling capabilities at USPACOM to understand and apply modeling tools for addressing leader analysis in support of COCOM decision making. • Developed experiment protocol for USEUCOM to research multiple model approaches in support to operational objectives. <p><i>FY 2009 Plans:</i> Synthetic forces are useful for doing 'what if' exercises for planning purposes during Phase 0, and during ongoing contingency planning. The synthetic forces used for these wargames/planning exercises are often not an accurate representation of adversary or green forces, and their reactions to U.S./coalition actions. The work will focus on demonstrating regional/cultural models in planning exercises through the use experimental testbeds.</p>				

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p><i>FY 2010 Plans:</i> Building upon FY 2008 and FY 2009, in this year, we will leverage: the developed; other models; work performed in visualization; cultural understanding; the development of specific and generalizable cultural models; the work done in the development of data frameworks to demonstrate a partial end to end process that uses the aspects described above; to support specific operational planning tasks for selected government partners via experimental testbeds.</p>				
<p>Training/Mission Rehearsal Systems</p> <p>Current methods and procedures for integrating cultural information into military operations do not satisfy the requirements for ongoing operations and are not flexible enough to rapidly deliver Just-In-Time training for complex new regions of interest, and relatively new mission areas (e.g. transition and reconstruction). Training systems capable of using flexible underlying cultural models to train at the operational/tactical level is a requirement. When combined with socio-cultural operational planning tools, they allow users to understand the socio-cultural environment. It is then possible to plan, and potentially rehearse non-kinetic actions prior to execution and make changes based on outcomes.</p> <p><i>FY 2008 Accomplishments:</i> The work integrated and demonstrated training technologies to deliver sociocultural understanding and skills needed by individuals, small units, and coalitions in current and future military operations.</p> <ul style="list-style-type: none"> • Initiated socio-cultural theory based training tool projects that leverage commercial investments in Internet-based technologies and DoD investments in training technologies to support HSCB training and mission rehearsal objectives. <p><i>FY 2009 Plans:</i> The work will demonstrate distributed training technologies to speed the development of socio-cultural skills in such coalitions in current military operations.</p>	0.960	2.330	2.597	

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p><i>FY 2010 Plans:</i> The work will integrate demonstrate socio-cultural training directly supported by hybrid modeling approaches.</p>				
<p>Visualization Software Toolsets</p> <p>This program demonstrates 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.</p> <p><i>FY 2008 Accomplishments:</i> Developed an implementation plan for prototype geospatial/socio-cultural collection, modeling and visualization technologies that focus on automated extraction of cultural data demonstration as a part of the MAP-HT JCTD.</p> <p><i>FY 2009 Plans:</i> Common, generalizable (strategic to tactical) tools for visualization of Diplomatic Infrastructure Military Economic - Political Military Economic Social Information Infrastructure (DIME-PMESII) or HSCB factors on the battlefield, or during Security, Stability, Transition and Reconstruction phases do not exist. The work will provide an initial demonstration of a common architecture for visualization of these effects, with the ability for commanders to "drill down" from regional to local views, and vice versa.</p> <p><i>FY 2010 Plans:</i> Demonstrate visualization tool sets that can access to underlying geospatial and socio-cultural data, evidentiary information, and associated uncertainty in the same visualization. Demonstrate visualization methods that can deal with sparse data sets.</p>	0.500	4.000	4.935	

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C. Other Program Funding Summary (\$ in Millions)										
	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	Cost To Complete	Total Cost
PE 0602670D8Z BA 2/ HSCB Applied Research	6.074	7.643	9.446						Continuing	Continuing
PE 0604670D8Z BA 4 /HSCB Research & Engineering	0.989	5.958	7.006						Continuing	Continuing
D. Acquisition Strategy										
N/A										
E. Performance Metrics										
N/A										

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