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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 2 - Applied Research					PE 0602670D8Z Human, Social and Culture BehaviourModeling (HSCB)Applied Research					
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	6.074	7.643	9.446						Continuing	Continuing
P270: Human, Social and Culture BehaviourModeling (HSCB)Applied Research	6.074	7.643	9.446						Continuing	Continuing

A. Mission Description and Budget Item Justification

(U) This program is focused on developing an applied science base and general-use, cross-domain capabilities/tools to support the HSCB applications domains of operational, planning, analysis, training and operations experimentation (wargaming). The work will focus on computational/analytical anthropological data collection, theory development, and application methodologies and tools. It will create software tools to allow decision makers (Intelligence analysts, operations analysts, operations planners, wargamers) to have available forecasting tools for socio-cultural (human terrain) responses at the strategic, operational and tactical levels. It will provide data infrastructure/frameworks that will facilitate subsequent model development and validation, human behavior based theory for DoD-relevant models; visualization infrastructures to rapidly assess the human terrain at strategic to tactical levels; and, situation-relevant education and training tools for disparate user communities.

Database Infrastructure/Framework will facilitate subsequent model development and validation.

Human behavior based theory, for DoD relevant Models, from created software that will allow decision makers to have available forecasting tools for socio-cultural (human terrain) responses at the strategic, tactical and operational levels.

Visualization Infrastructure designed to rapidly assess the human terrain at strategic levels, and development and mature situation relevant education and training tools for disparate user communities.

Situation-relevant education and training tools will focus on computational/analytical anthropological data collection, theory development, and application methodologies and tools.

UNCLASSIFIED

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APPROPRIATION/BUDGET ACTIVITY 0400 - Research, Development, Test & Evaluation, Defense-Wide/BA 2 - Applied Research	R-1 ITEM NOMENCLATURE PE 0602670D8Z Human, Social and Culture BehaviourModeling (HSCB)Applied Research
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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	6.246	7.685	9.609	
Current BES/President's Budget	6.074	7.643	9.446	
Total Adjustments	-0.172	-0.042	-0.163	
Congressional Program Reductions				
Congressional Rescissions		-0.042		
Total Congressional Increases				
Total Reprogrammings				
SBIR/STTR Transfer	-0.158			
Undistributed reductions	-0.014			
Other			-0.163	

UNCLASSIFIED

UNCLASSIFIED

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

	FY 2008	FY 2009	FY 2010	FY 2011
Data Infrastructure/Framework	1.328	2.000	2.964	

UNCLASSIFIED

R-1 Line Item #16

Page 3 of 8

UNCLASSIFIED

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p>Generation of functional architectures for managing and disseminating socio-cultural data, information and analysis products vertically and horizontally within DoD. Strategies to collect cultural and societal information in denied or difficult to penetrate areas. Development of hand-held/portable tools to collect cultural and societal information.</p> <p><i>FY 2008 Accomplishments:</i> Developed methods and tools to allow remote and “boots on the ground” collection of pedigreed social and cultural information relating to a population (local, regional, global), including the print, voice, and video media, social networks, and cultural, religious and tribal alliances. The work focused on areas of operation in USCENTCOM, USPACOM, and USEUCOM. The work is identifying methods to collect relevant socio-cultural data for Phase 0 and Phase 4 operations.</p> <p>Accomplishments:</p> <ul style="list-style-type: none"> • Initiated framework to implement end to end collection, normalization, modeling, and analysis infrastructures and frameworks for HSCB modeling in partnership with MAP-HT JCTD. • Initiated the integration of COMPOEX modeling framework to support hybrid model use. <p><i>FY 2009 Plans:</i> Develop technologies capable of collecting, storing, and normalizing data and establishing semantic translation for mapping relevant data to common schema. This will provide DoD with the capability to broadly disseminate socio-cultural data across operational levels (Strategic to Tactical) and between user communities (Intelligence, Influence Operations, Planners).</p> <p><i>FY 2010 Plans:</i> Develop technologies capable of extracting relevant data into databases for further modeling to support denied, restricted, or unavailable area ethnographies. Develop technologies capable of leveraging extracted data (e.g. from surveys), and processing and validating it. Develop technologies in which data can be ascribed a measure of veracity and with evidentiary value such that with the data is broadly useful as it perpetuates throughout the system. Examine the use of general use meta data technologies for multi purpose/multi modal applications.</p>				

UNCLASSIFIED

R-1 Line Item #16

Page 4 of 8

UNCLASSIFIED

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p>Human behavior based theory for DoD Models</p> <p>Validation techniques across the spectrum of applications (Intelligence, Influence Operations, Planning) applied to quantitative models of social-cultural factors in coalition warfare, as well as those social cultural factors of military significance for emerging conflicts. A human behavior modeling framework that is independent of specific sociocultural values, attitudes and beliefs.</p> <p><i>FY 2008 Accomplishments:</i> Created and validated, human terrain forecasting models that enable examination of second, third, and higher order effects of kinetic and non-kinetic actions within a theater in support of current operations. The work provided an initial DoD capability to model intended or unintended Political, Military, Economic, Societal, Infrastructure and Information (PMESII) effects of military actions.</p> <p>Accomplishments:</p> <ul style="list-style-type: none"> • Initiated efforts to develop the cultural basis of models and simulation environments. • Completed workshops that collected and assimilated industry, academia, and military inputs associated with HSCB cultural understanding and technologies. • Completed workshop on strategic communication to understand the social and technical issues associated with audience analysis, message dissemination and other topics. • Completed field assessments of a “measuring progress in conflict environments” application. <p><i>FY 2009 Plans:</i> Most models and forecasting tools are built upon experiences in a single region, a single coalition force, etc. and are not generalizable to other regions. The work will develop more generalizable models and tools that can be /reused for other regions of interest, allowing DoD to give more consideration to human, social and cultural factors in early (Phase 0) planning</p> <p><i>FY 2010 Plans:</i> Focus on the application of hybrid modeling environments where hybrid means using a combination of the major modeling modalities (systems dynamics, game theoretic and agent). Develop the theory to support hybrid, generizable models across the spectrum from tactical to operational to strategic.</p>	3.500	2.958	3.952	

UNCLASSIFIED

UNCLASSIFIED

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
Research the effectiveness of generizable models at the tactical, operational and strategic levels and determine the data fidelity requirements for each level of modeling.				
<p>Situationally-relevant education and training tools</p> <p>Prototypes capable of using flexible underlying cultural models for training at the operational/tactical level. Training prototypes will be focused on relevant operational scenarios (e.g., negotiation with Middle-Eastern civilian and military forces).</p> <p><i>FY 2008 Accomplishments:</i> 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). The work provides supporting technologies to speed the development of socio-cultural understanding and the skills needed by individuals, small units, and coalitions in current and future military operations.</p> <p>Accomplishments: • Initiated analysis of cultural models that would support analysis and training tools.</p> <p><i>FY 2009 Plans:</i> Tactical to strategic level kinetic and non-kinetic actions can have a large impact on green force behaviors and beliefs. The work will develop technologies, models, and skills to increase operational effectiveness through the rapid integration of socio-cultural factors into social influence tactics and information operations in current military conflicts. The goal is to accelerate the development of nontraditional, field capable technologies that enable the training/mission rehearsal of non-technical, adaptive skills related to cultural understanding, interpersonal communication, and teamwork.</p>	0.446	1.335	1.048	

UNCLASSIFIED

UNCLASSIFIED

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B. Accomplishments/Planned Program (\$ in Millions)	FY 2008	FY 2009	FY 2010	FY 2011
<p><i>FY 2010 Plans:</i> Operational and Strategic level non-kinetic actions can be a large force multiplier. The work will develop technologies, models, and skills to focus on the insertion of technologies to support COCOM and operational level training for planners who will need to integrate socio-cultural factors into operational planning (allowing for the planning, software execution, and rehearsal of certain non-kinetic operations).</p>				
<p>Visualization Infrastructure Common categorization of meta-information (i.e., the data source and pedigree, what types of uncertainty are associated with it, how old is the data, etc.) in existing visualization tools/decision aiding systems. Methods for visually and digitally depicting the incomplete, subjective, volatile, and/or imprecise nature of cultural information to support manual and automated analysis.</p> <p><i>FY 2008 Accomplishments:</i> Developed data tagging schemes that support network enabled, collaborative geospatial visualization displays. Within DoD there are multiple sources and venues for the creation and distribution of information and data on human, social and cultural behavior (HSCB). To reuse and represent this data across systems/applications required the development of new meta-data standards that support visualization/mapping. Investigated the optimal common meta-data standards for the HSCB area.</p> <p>Accomplishments: • Initiated the development and demonstration of prototype geospatial/socio-cultural collection, modeling and visualization infrastructure utilizing the research framework of the MAP-HT JCTD.</p> <p><i>FY 2009 Plans:</i> Development of visualization methods for displaying uncertainty in common geospatial tools currently used by DoD. The dynamic complexity of human behavior, beliefs and cultures means that there will always be some level of uncertainty to forecasting and mapping the human terrain. It is vital to accurately represent this degree of uncertainty in geospatial toolsets, decision aids, etc. The work will develop generalizable methods/tools for displaying this uncertainty.</p>	0.800	1.350	1.482	

UNCLASSIFIED

UNCLASSIFIED

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<p><i>FY 2010 Plans:</i> Development of visualization infrastructure that display hybrid data sources such as geospatial layers, person and group relationships, and related socio-cultural data in ways that are easy for the user to assimilate and that address how evidence is created using provided data and how uncertainty propagates throughout the system.</p>										
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 0603670D8Z BA 3 /HSCB Advanced Development	2.960	9.330	11.631						Continuing	Continuing
PE 0604670D8Z BA 4 / HSCB Research and Engineering	0.989	5.958	7.096						Continuing	Continuing
D. Acquisition Strategy										
N/A										
E. Performance Metrics										
N/A										

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