

Unclassified



Training & Simulation Industry Symposium *Army Training - Current Fight ... to the Future*

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Scope of Remarks



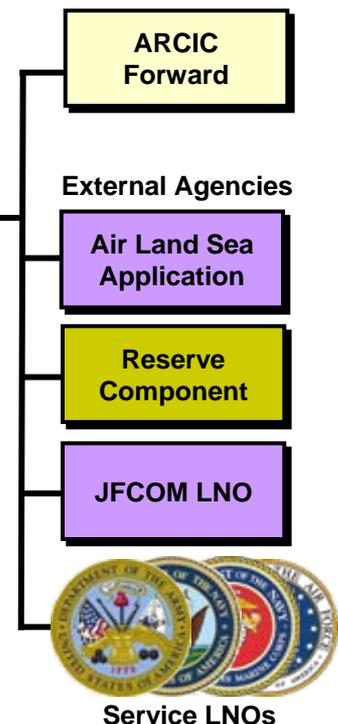
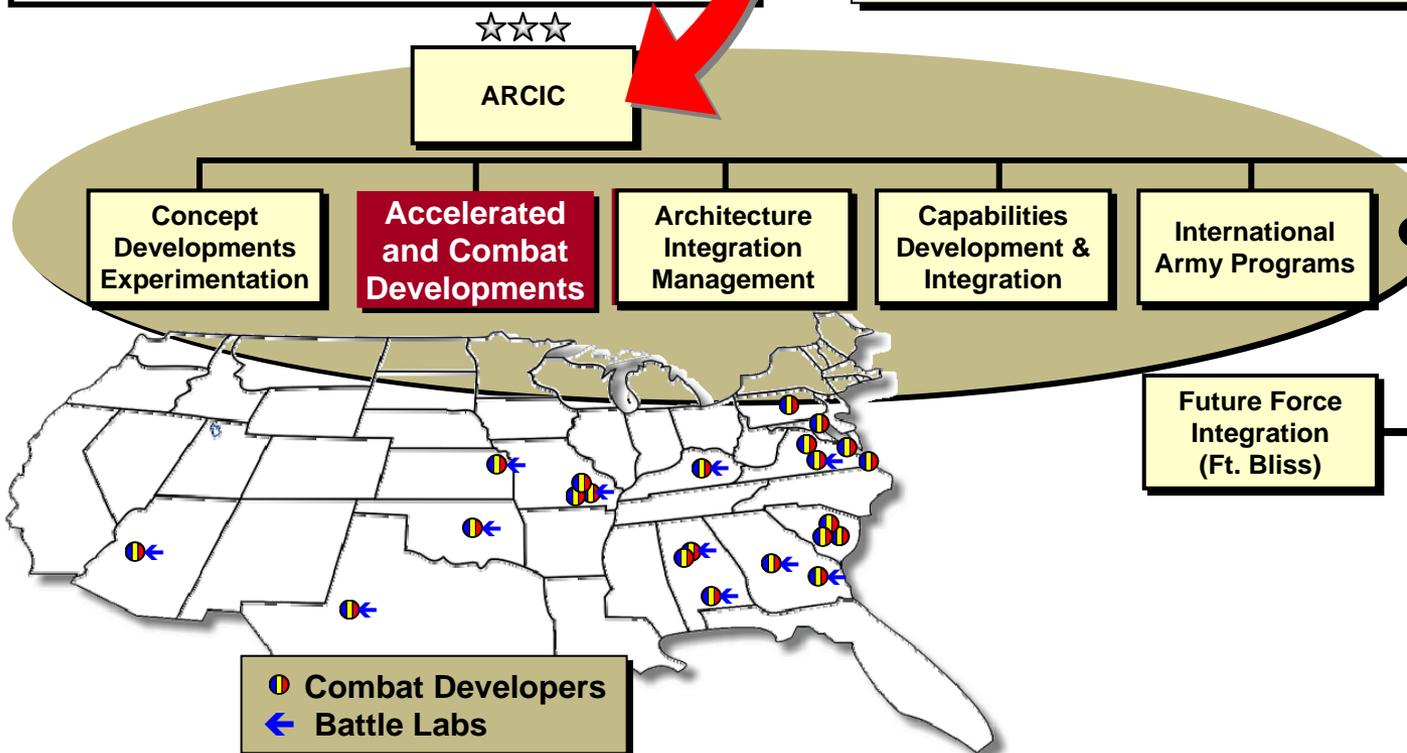
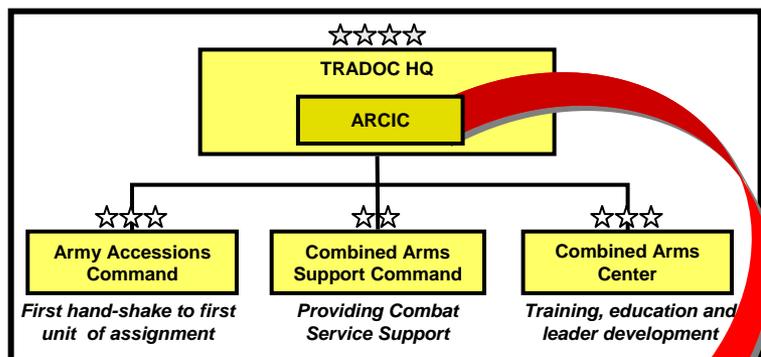
- Intro – *What ARCIC does and how that impacts Army training – “accelerated” vice “deliberate” developments*
- Describe collection of practices *contributing to accelerated capability developments (across DOTMLPF)*
- Identify challenges: *training for the current fight*
- Describe Scope of new Human Dimension (HD) Concept



Army Capabilities Integration Center



The Army Capabilities Integration Center (ARCIC) designs, develops, integrates and synchronizes force capabilities for the Army across the DOTMLPF imperatives into a Joint, Interagency, and Multinational operational environment from concept through capability development.





Paradox of Capabilities Development



Sustain/Upgrade Current Force

Positive Results – *focus on left side*

- Re-capitalize current investment
- Proven capabilities
- Fewer unknowns
- Less developmental risk
- More affordable in budget
- Reduces obsolescence

Negative Results – *over focus on left side*

- Reliance on OLD systems
- Limited network applications
- Large logistics footprint
- Decreased deployability
- Greater support costs

Develop Future Forces

Positive Results – *focus on the right side*

- Revolutionizes brigade capabilities
- Networked C2 and effects
- Logistically easier
- Improved deployability
- Greater tooth to tail ratio
- Lower support costs

Negative Results – *over focus on the right side*

- Higher risks
- Unknown capabilities
- Obsolescence of legacy systems
- Upgrades only a % of force
- More expensive



More
capable &
Supportable
force

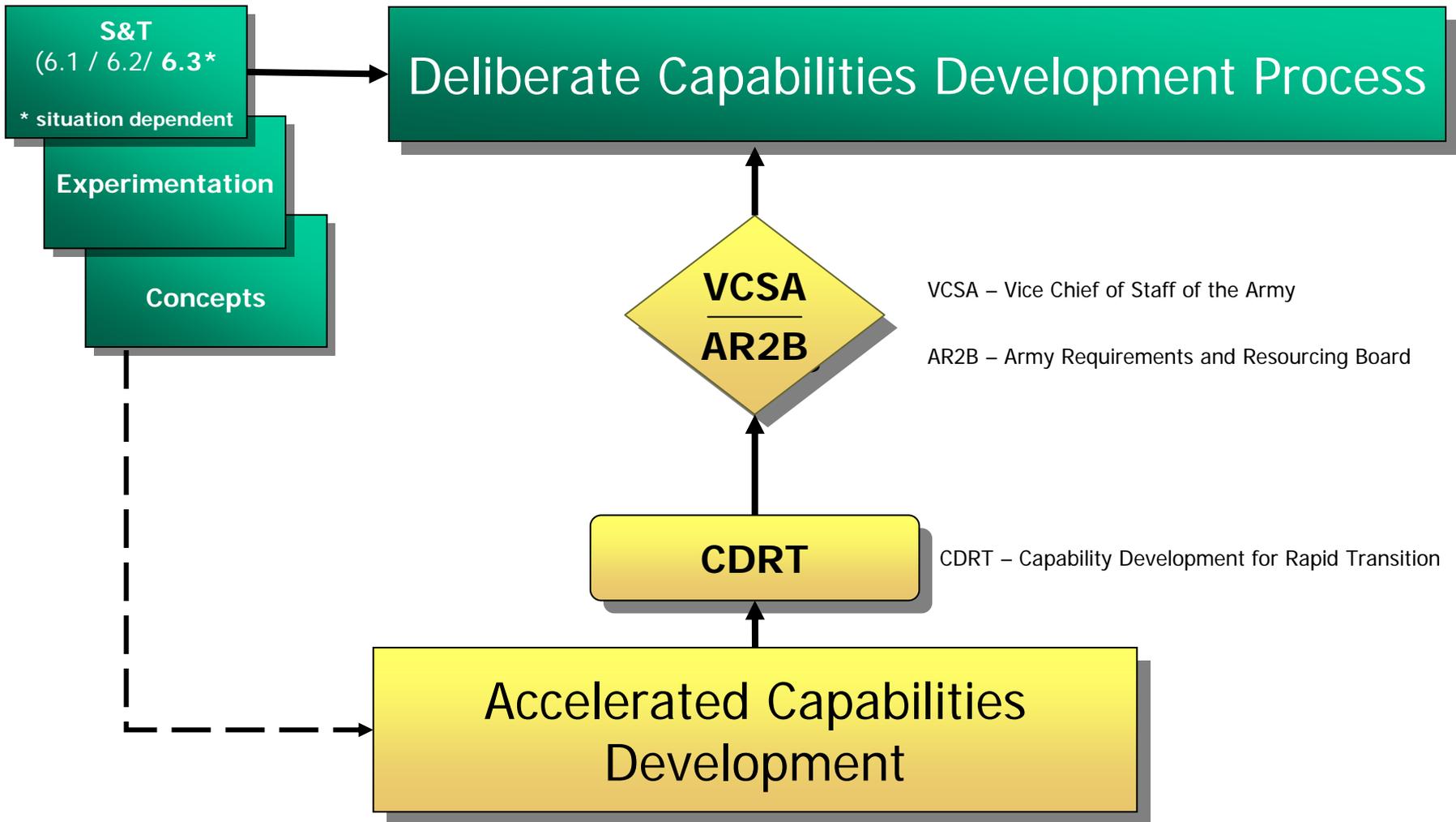


Less
capable &
Supportable
force

Managing Polarity - Balancing Resources (\$ and People)

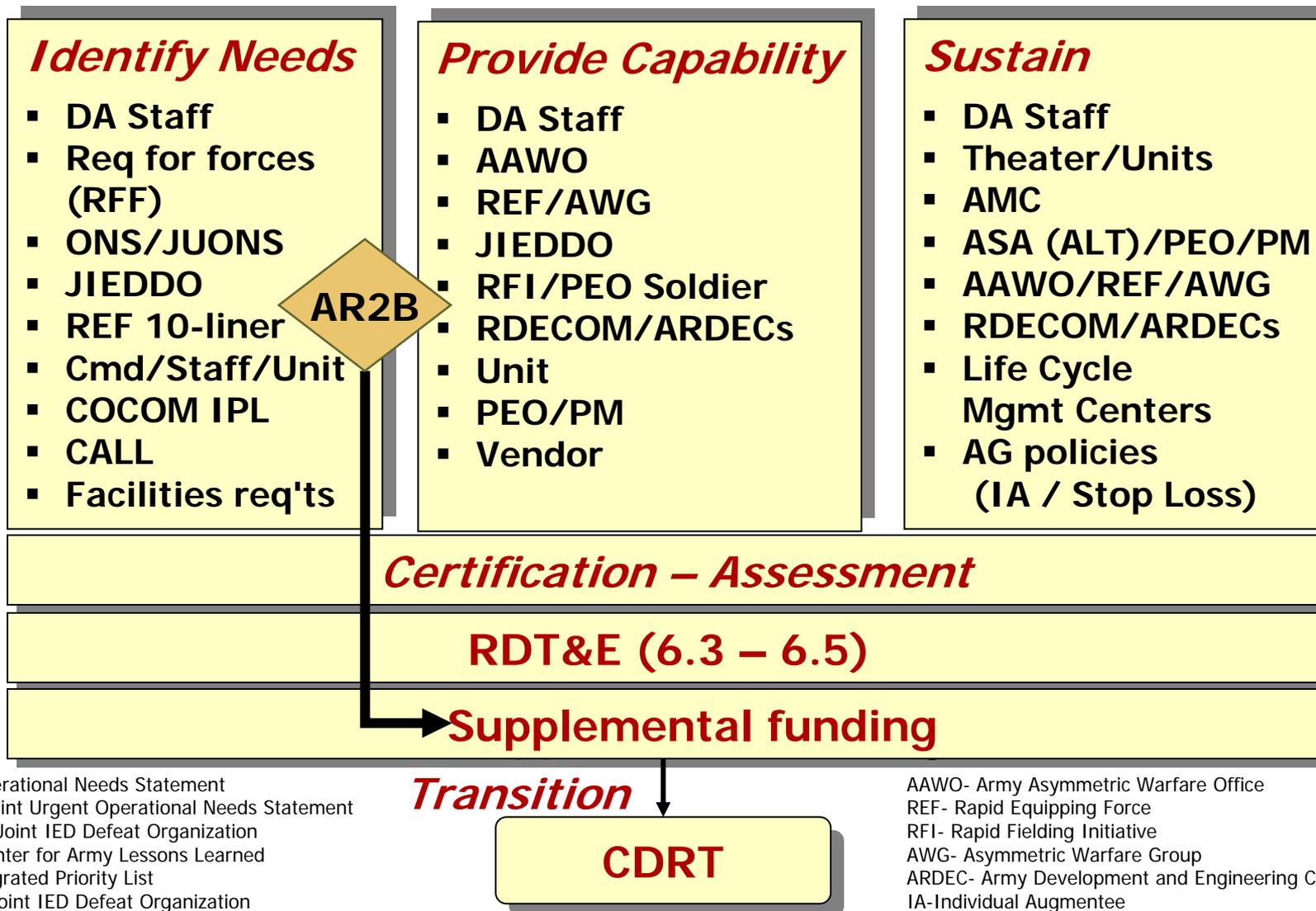


Capabilities Developments (Across DOTMLPF domains)





Accelerated Capabilities Development Practices





Accelerated Capabilities Development Challenges



Identify Needs

- **Visibility**
 - ✓ Found in Theater (FIT)
 - ✓ DOTLPF 'needs'
- **Capability looking for a need**
- **Prioritization**
 - ✓ Assessment/validation
 - ✓ Abbreviated AoA
- **M&S for IW**
- **Resurrected POR**

Provide Capability

- **Lead/integration/synchronization**
- **Initial in-theater sustainment (contractor)**
- **CONOPS**
- **DOT – PLF integration**
- **Law & policy implications**
- **Certification/safety/information assurance**

Sustain

- **Accountability**
- **2 year funding limitations**
- **TPE – formal/informal**
- **Training – transition after initial equipping and institutionalization**
- **Capability termination**

Certification

- **Safety (ATEC / TACOM / CECOM)**
- **Net worthiness and spectrum management (NSA/NETCOM/ Central Technical Support Facility (CTSF))**
- **Information assurance (IA)**
- **Medical (FDA)**
- **Coalition-Sharing (DOS)**

Assessment

- **Pre-deployment, in-theater, post deployment**
- **Metrics (complex capabilities)**
- **Models and studies (IW)**
- **Analysis of relative value**
- **Assessment & Soldier feedback**
- **Comprehensive data bases**



Current and Future Force Development... Learning from the Force in Contact



Combat experience informs Future Force Development



Future Force Development 'spins out' advanced technology to enhance current capabilities

'Leading from the Edge' is taking advantage of the current operational environment to inform and adjust our force development model



Future WarFighter Outcomes – Desired Training Capabilities



- Provide Soldiers and leaders the ability to excel in a challenging and increasingly complex future operating environment by developing tools and technologies that enable **more efficient training** through live, virtual, immersive and adaptable venues. Future training must enable the Future Force to impart **more skills, faster, at lower cost and with a higher degree of retention** than currently achievable. Future training must be completely **adaptable and scalable** to cover the **full spectrum of operational challenges facing the Soldier**.
- At Risk Areas:
 - **Tools to incorporate lessons learned** and **rapidly adapt training** to meet immediate mission requirements.
 - **Real time diagnostic evaluation tools of individual and unit performance** to identify performance limitations vs tasks.
 - Embedded training integration incorporating **automated coaching and learning management**.
 - **Adaptable and scalable training tools** that provide function across the full spectrum of operational environments.



Training Challenges ... into the Future



Conflict focused on Population Centers

Cultural Diversity/ Differences

Tasks Required are Increasing

Operational Dilemmas Common

Pre-deployment Time at a Premium

Home Station and on the Battlefield

Command and Leadership





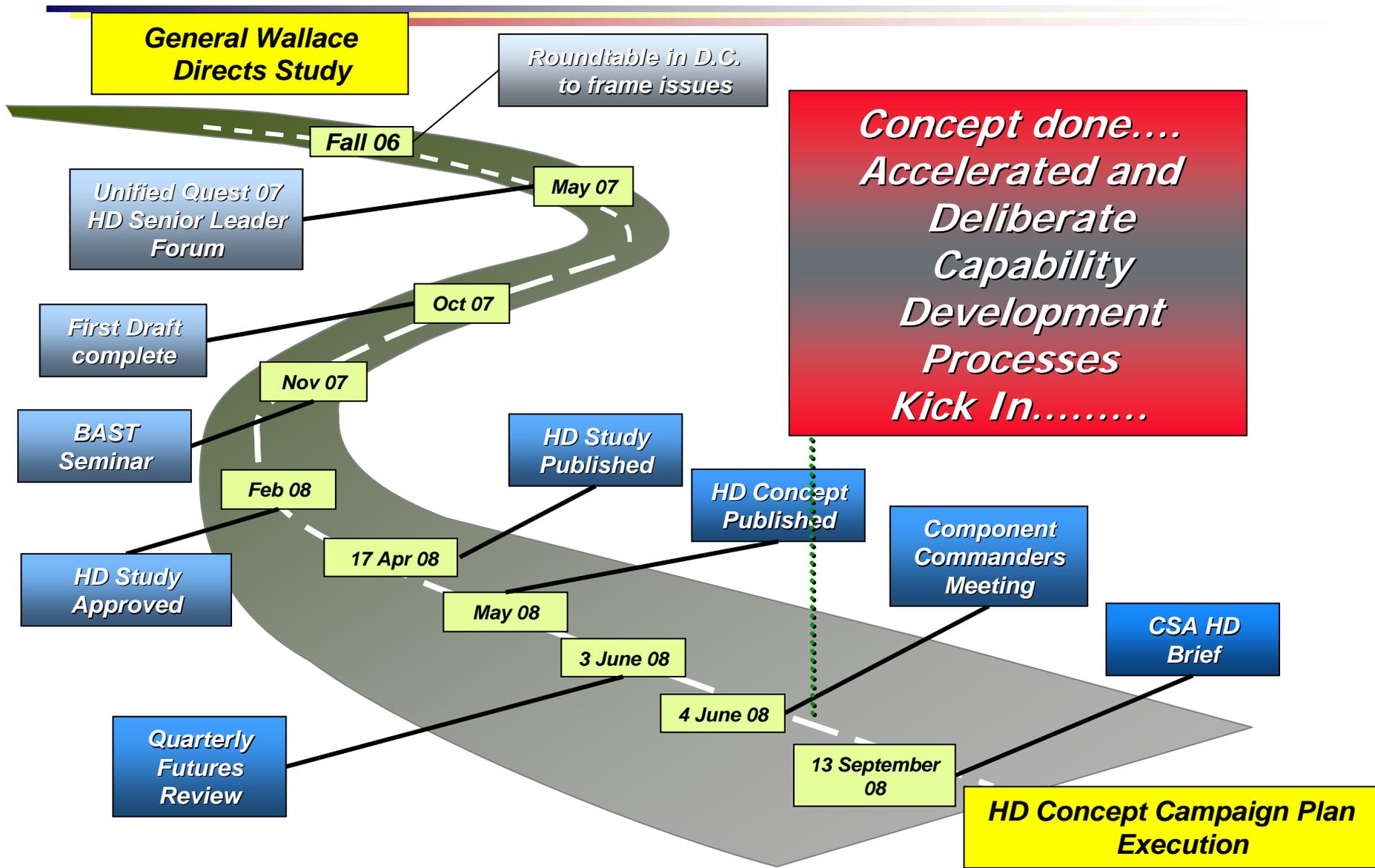
TRADOC CG Guidance – The Army HD Concept



- The “**Human Dimension**” requires a thorough, credible and detailed examination.
- Examine the **behaviors, intuition and performance** that impacts **individual decisions** and actions in **interaction with other humans, technologies and environments**.
- The role of the Human Dimension must be examined not only in combat operations, but also in **assessment and force generation to include consideration of projected shifts in US demographics**.
- **Analyze the full life cycle of the Soldier** from recruitment and training through deployment, redeployment and reintegration into society.
- Must be applicable to the **future Operating Environment**.



Human Dimension (HD) Timeline

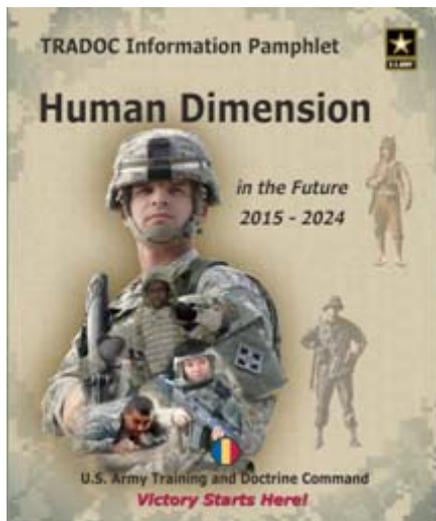




HD Concept Products

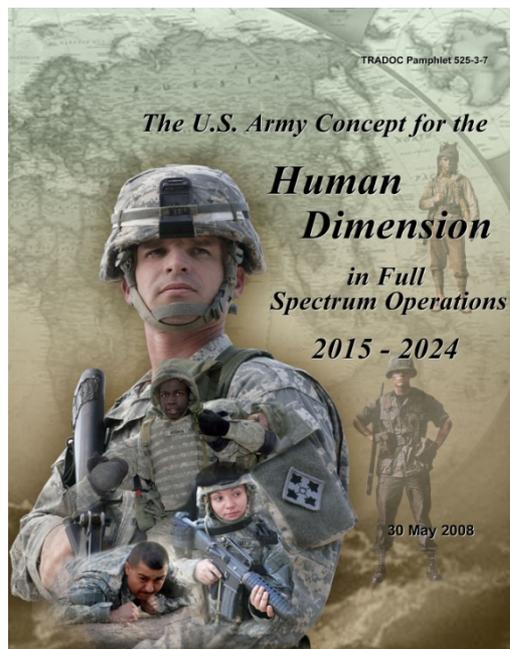


General Audience



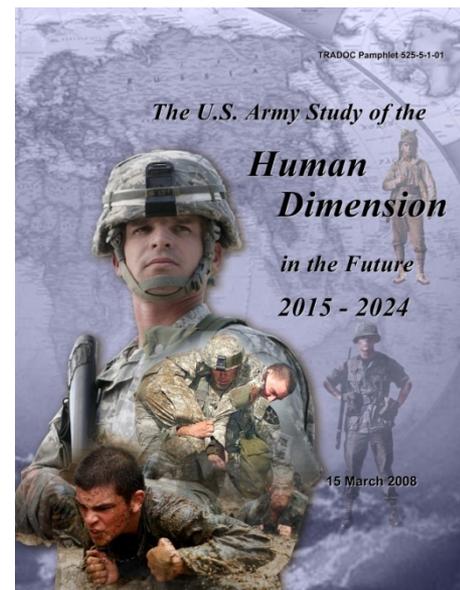
Handout
13 pages

Joint & Army Senior Leaders



Concept
39 pages

Research & Concept Development Communities



Study
239 pages

To access these products: <http://www.tradoc.army.mil/tpubs/pamndx.htm>



Human Dimension Findings



Given the Joint and Domestic Operational Environments in an Era of Persistent Conflict:

Manning the All Volunteer Force will be increasingly difficult.

It will be difficult to sustain a high unit OPTEMPO.

Holistic fitness must consider Soldier physical, medical, and nutritional health.

Soldiers will face increasingly difficult operational dilemmas that test their willingness to behave ethically and maintain discipline in the face of very stressful events.

Training and educating the All Volunteer Force will be increasingly complex.

Traditional face-to-face leadership methods alone will not suffice, nor will all the sophisticated network tools of the future produce effective leaders.



Army Terms of Reference - HD



- *Human Dimension: That which encompasses the cognitive, physical, and moral components of Soldier, leader, and organizational development and performance essential to raise, prepare, and employ the Army in full spectrum operations.*
 - ***Cognitive Component***: *Within the human dimension, what a Soldier must **know, process and understand** in order to perform essential **intellectual tasks and functions**.*
 - ***Physical Component***: *Traditional aspects of physical fitness such as **strength, endurance, tolerance, flexibility, and coordination**, along with **holistic fitness**, an approach that considers **neural and medical contributions to physical performance**.*
 - ***Moral Component***: *In relation to the human dimension, it consists of **three elements**; **warrior spirit, moral-ethical development, and socio-cultural awareness**.*



On-Going Cognitive Performance R&D



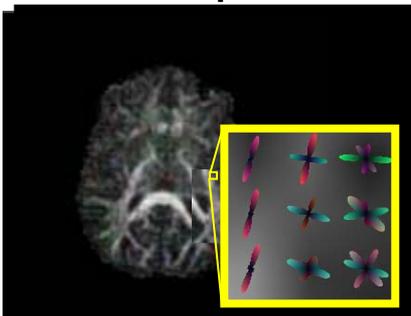
- BAST - Study of Neuroscience Applications for the Army
- fMRI at UCSB (ICB UARC – NTC O/C Study – Mind Mapping)
- fMRI at UT Austin (IAT UARC – USMA Athletes and Fort Hood)
- QEEG at Arizona State (West Point Leadership Study)
- Computationally optimized diffusion PAS MRI at University of Pittsburg
- DARPA – Accelerated Learning; Neurotechnology; Augmented Cognition
- RDECOM/ARL-HRED (Proposed Army Technology Objectives)
- MRMC/AMEDD (Advanced Battlemind Training) – PTSD / TBI
- ARI – Leader Development Research Stress / Fatigue
- FFID FCS Battle Command Cognitive Performance Research
- Industry
 - GD Edge - Human Dimension
 - South Carolina



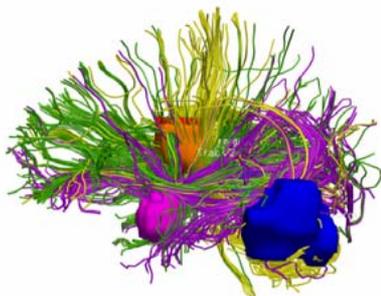
Neurological Measurement Tools



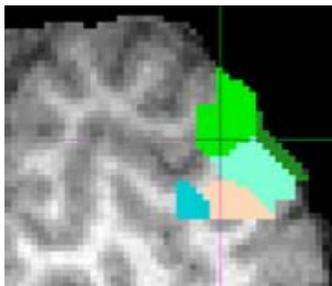
1. Diffusion Spectrum MRI



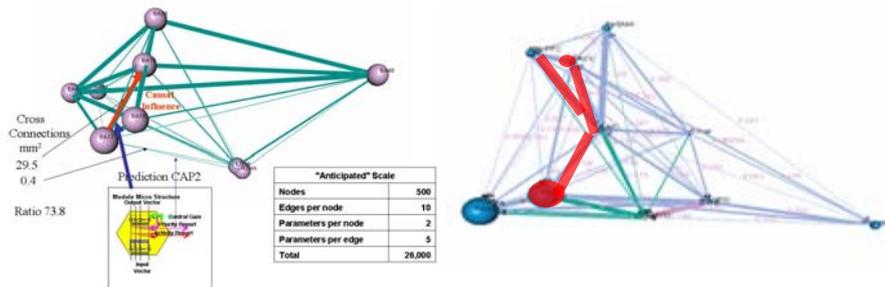
2. Fiber Tracking



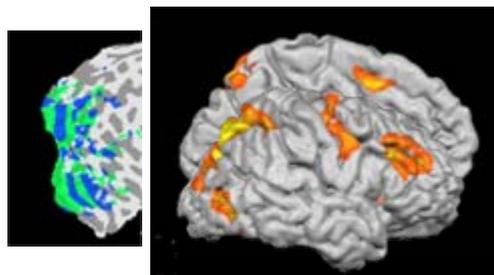
3. Cortex Segmentation



4. Brain Connective Topology



5. fMRI Functional Mapping



6. Individual Connectome

ID	Loc	Size	Anatomy Connect	Functional Connect
1	33, 33, 44	1211	AIC (96) PMC (45)	← PMFC (0.4, .72) ← AIC (0.2, .69)
...
500

- ❑ Psychological assessments
- ❑ Physiological assessments
 - Mind Mapping
 - fMRI
 - QEEG
 - Eye Tracking
- ❑ Brain Chemistry
- ❑ Genetic Factors



Senior Steering Group - HD



- Effects of stress of current operations on the Soldier are not fully understood
- Increased S&T investment from variety of sources
- Cross-cutting nature of challenges/potential solutions
- Complexity of problem
- Large number of organizations conducting related S&T
- Desire to create a common vision
- Synchronization of efforts for maximum benefit





So What? – Why Cognitive Performance?



- Nature vs. Nurture – what we can and cannot change
- Better Accessions Criteria
- Training - Cognitive PT Test - build capability & experience
- Decision Making – assessing, engaging, interacting with enemy, friendly or neutral forces
 - Battle Command System spatial navigation - male/female
 - Cognitive UCOF – expert training decision template (intuition / wisdom)
 - Brain Chemistry – Initiative / risk taking research
- Stress and Fatigue
- More effective treatments for TBI and PTSD (Fear)
- Memory Enhancement



Conclusion



The human dimension has always been the most critical dimension of military operations. Soldiers are the ultimate focus of land operations.



***“No two persons are born exactly alike ... All things will be produced in superior quantity and quality, and with greater ease, when each man works in accordance with his natural gifts.”
(Plato, The Republic, c. 360 B.C.).***