

Army Human Systems Integration Policy Office

HSI Data Flow

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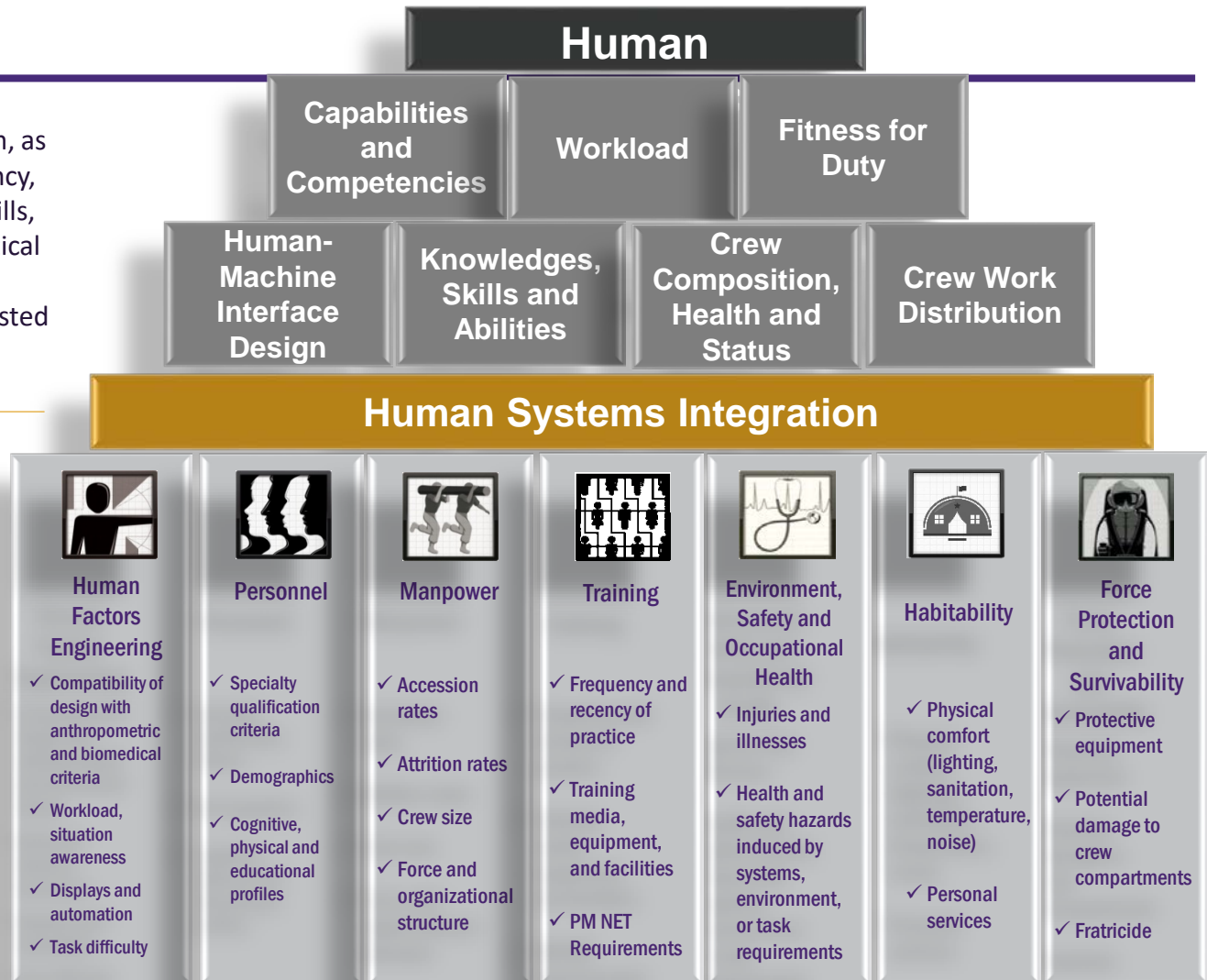
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The HSI Architecture

Can this Soldier/Civilian/Team, as part of a unit/formation/agency, with the requisite training/skills, perform and lead mission critical tasks, using equipment and processes, in expected/contested environments, be successful?



Army Human Systems Integration Program IAW AR 602-2 and DA PAM 602-2

FALSE

1. All applied human systems researchers are HSI analysts
2. HSI analysts only support PEOs/PMs & ATEC
3. HSI analysts have one designated career field
4. All HSI work originates in one place within the Army
5. The only HSI output is the HSI assessment
6. HSI is a DAU Career Program & HSI analysts are Acquisition Corps Members

TRUE

1. HSI analysts *can* function as applied researchers
2. HSI analysts support the entire FFME (PEOs/PMs, ATEC, AMSAA, CCDC Centers (previously RDECs), and TRADOC)
3. HSI analysts are hired in 15 different OPM job codes – primarily as research psychologists, ORSAs, engineers, etc...
4. HSI work occurs at/ICW ATEC, Army Safety Centers, the Army Public Health Center, and within the CCDC Centers
5. HSI outputs / knowledge products include technical reports, system design input/feedback, source selection criteria, contract language, TEMP (input), SEP (input), T&E MOE/MOP (input), and COICs (input),
6. Focused HSI Instruction is taught within DAU Career Programs and Certifications; however, HSI is not a standalone acquisition career field/code and the vast majority of the workforce are not members of the Acquisition Corps

ARL = Army Research Laboratory
 CCDC – Combat Capabilities Development Command
 COIC = Critical Operational Issue Criteria
 DAC = Data and Analysis Center
 FFME = Future Force Modernization Enterprise
 HRED = Human Research & Engineering Directorate

MOE = Measure of Effectiveness
 MOP = Measure of Performance
 SEP = Systems Engineering Plan / System Evaluation Plan
 TEMP = Test and Evaluation Master Plan



Army HSI Practitioner Position Duties as per AR 602-2

1. Conduct a proactive Army HSI Program for all systems assigned.
2. Plan for and assess HSI domain-specific and cross-domain HSI issues
3. Include all required and appropriate HSI requirements and tradeoff analyses associated with Analysis of Alternatives and source selection.
4. Conduct technical and programmatic tasks necessary to resolve HSI issues and concerns before each milestone decision review (MDR).
5. Apply HSI methodologies to hardware and software development, modernization, and acquisition programs.
6. Maintain an Army HSI issues log to track and resolve HSI issues and concerns during the acquisition program life cycle.
7. Identify HSI-related program dependencies on other systems.
8. Lead HSI working groups and represent Army HSI on other appropriate Integrated Product/Process Teams (IPTs).
9. Crosswalk HSI performance parameters, objectives, and thresholds from the capabilities documents to the request for proposals (RFP), System-Sub/System Specifications (SSS), Software Requirements Specifications (SRS), and Test and Evaluation Master Plan (TEMP).
10. Develop funding and resourcing requirements for effective Army HSI Program implementation, testing, and maintenance.

SOURCE: AR 602-2 Army Human Systems Integration in the Systems Acquisition Process, pg 4, Section 2-12.

HSI Data (Operational Test) Recommendations

DOT&E Director's Corner (EXCERPT)

DOT&E to update guidance to **encourage credible, systematic evaluations of HSI**, consistent with Fiscal Year (FY) 2019 National Defense Authorization Act (NDAA) Section 227, Human Factors Modeling and Simulation Activities.

Encourage programs to **incorporate warfighter feedback** into the full system lifecycle from development and testing to operations and sustainment.

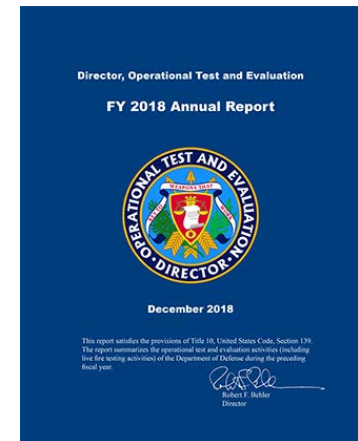
Align operational test of HSI with modern industry and scientific standards.

DOT&E = Director, Operational Test & Evaluation

HSI Data (Operational Test)

2018 DOT&E Systems with HSI Implications. 9 out of 24 (37.5%) systems* had notable HSI deficiencies characterized by the following:

- Complex systems design increases user workload
- System design induces user errors negatively impacting reliability
- Insufficient training and technical manuals increasing the logistical footprint, reliance on FSRs, and increased maintenance times (and manpower to perform maintenance).
- Poor system design (human factors) impacting situational awareness, system-setup, etc...



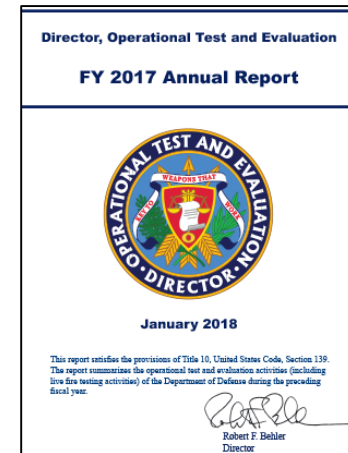
* These only account for major systems on the Office of Secretary of Defense (OSD) Oversight. There are many more systems tracked within the Army and being worked by HSI Practitioners.

DOT&E = Director, Operational Test & Evaluation

HSI Data (Operational Test)

2017 DOT&E Systems with HSI Implications. 11 out of 20 (55%) systems* had notable HSI deficiencies characterized by the following:

- Deficient and inadequate user training (new equipment training)
- Poor system designs degrading crew accommodations (ergonomics), requirements for safe egress, and impeding users to quickly perform maintenance
- Complex procedures for system set-up and troubleshooting (fault isolation)
- Insufficient system meta-data to support individual requirements to assess and mitigate network and other non-networked system health issues



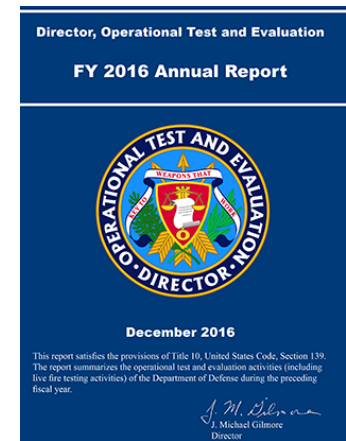
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DOT&E = Director, Operational Test & Evaluation

HSI Data (Operational Test)

2016 DOT&E Systems with HSI Implications. 13 out of 18 (72.2%) systems* had notable HSI deficiencies characterized by the following:

- Complex systems design increases user workload
- System design induces user errors negatively impacting reliability
- Insufficient training and technical manuals increasing the logistical footprint, reliance on FSRs, and increased maintenance times (and manpower to perform maintenance).
- Poor system design (human factors) impacting situational awareness, system-setup, and personnel survivability.
- Invalidated user requirements



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DOT&E = Director, Operational Test & Evaluation

Army Science Board Recommendations

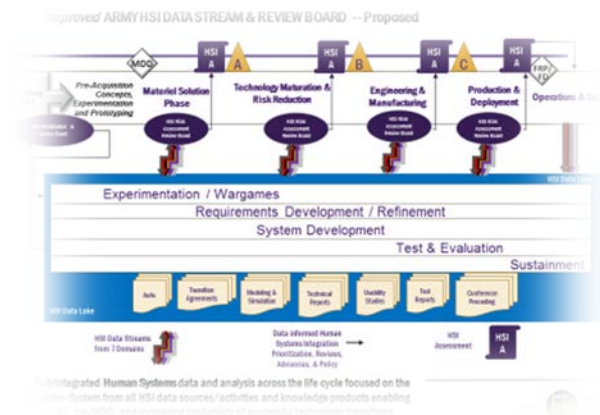
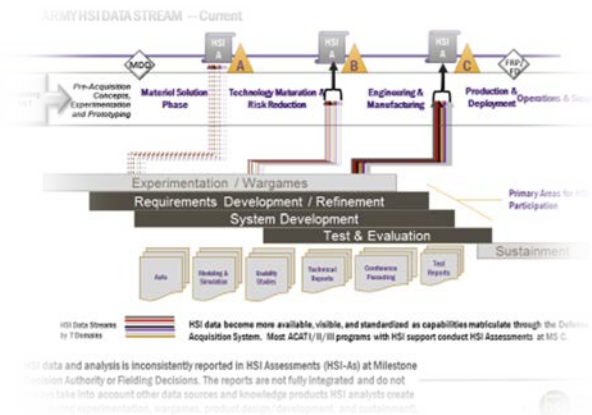
Army Science Board (EXCERPT)

- ✓ Invest in organizational strategies and processes that **emphasize early integration of end-users in the development process.**
- ✓ Early integration of end-users in the development process is critical in validating and expediting capability development and overcoming the "Valley of Death", where innovative technologies languish instead of contributing to warfighting capabilities

(REF: ASB Final Report, Improving Transition of Laboratory Programs into Warfighting Capabilities through Experimentation, 2017)

ASB = Army Science Board

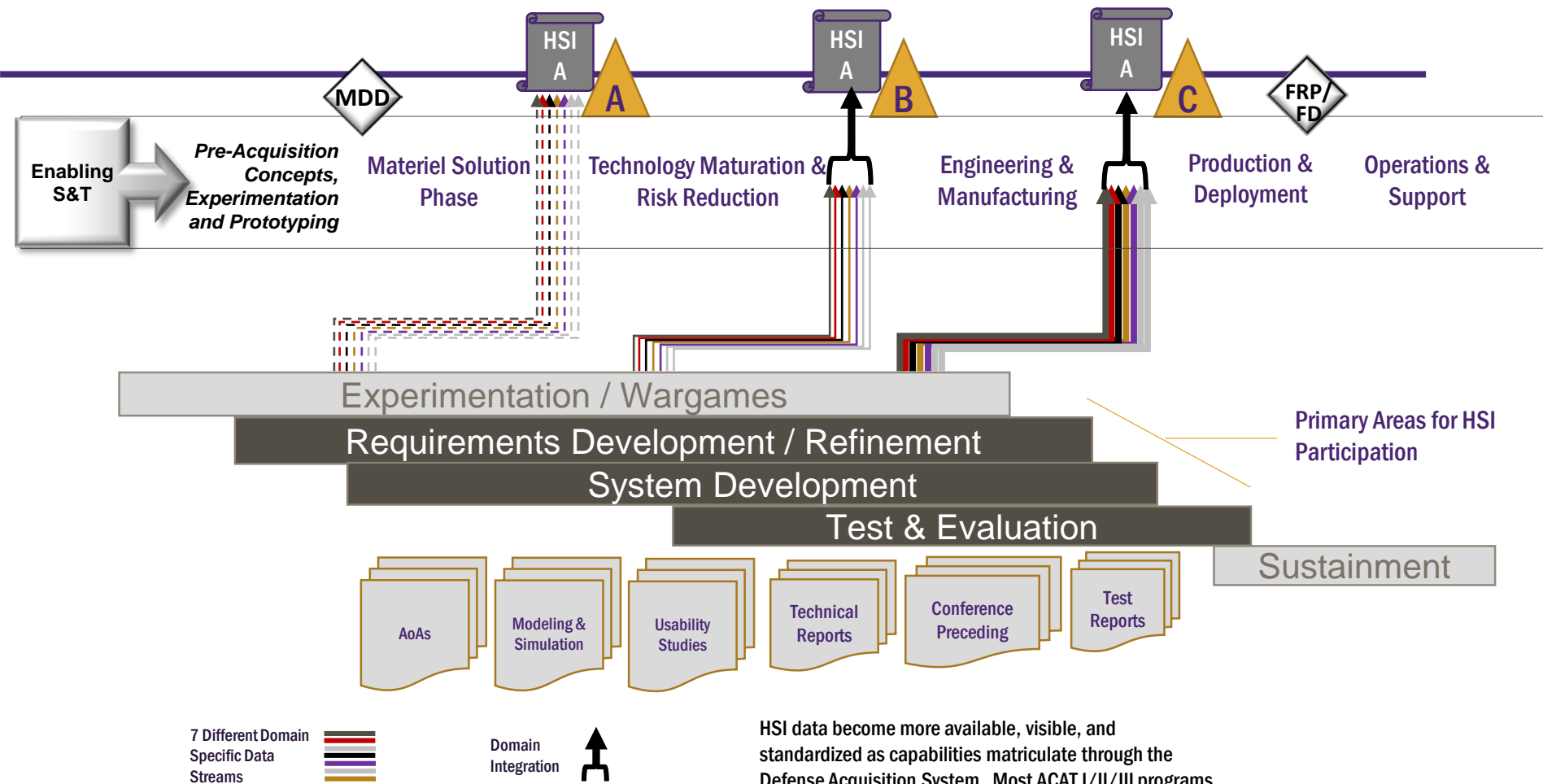
HSI Data Flow



- × Limited reporting and planning pre-MDD
- × Limited and inconsistent use of data, knowledge products, and warfighter events
- × Limited/no predictive ability to prioritizing HSI focus areas pre-MDD based on fielded system issues

- ✓ Full reporting and resourced informed decisions pre-MDD
- ✓ Holistic and consistent use of data, knowledge products, and warfighter events
- ✓ Predictive capability to prioritize HSI focus areas for during pre-MDD activities

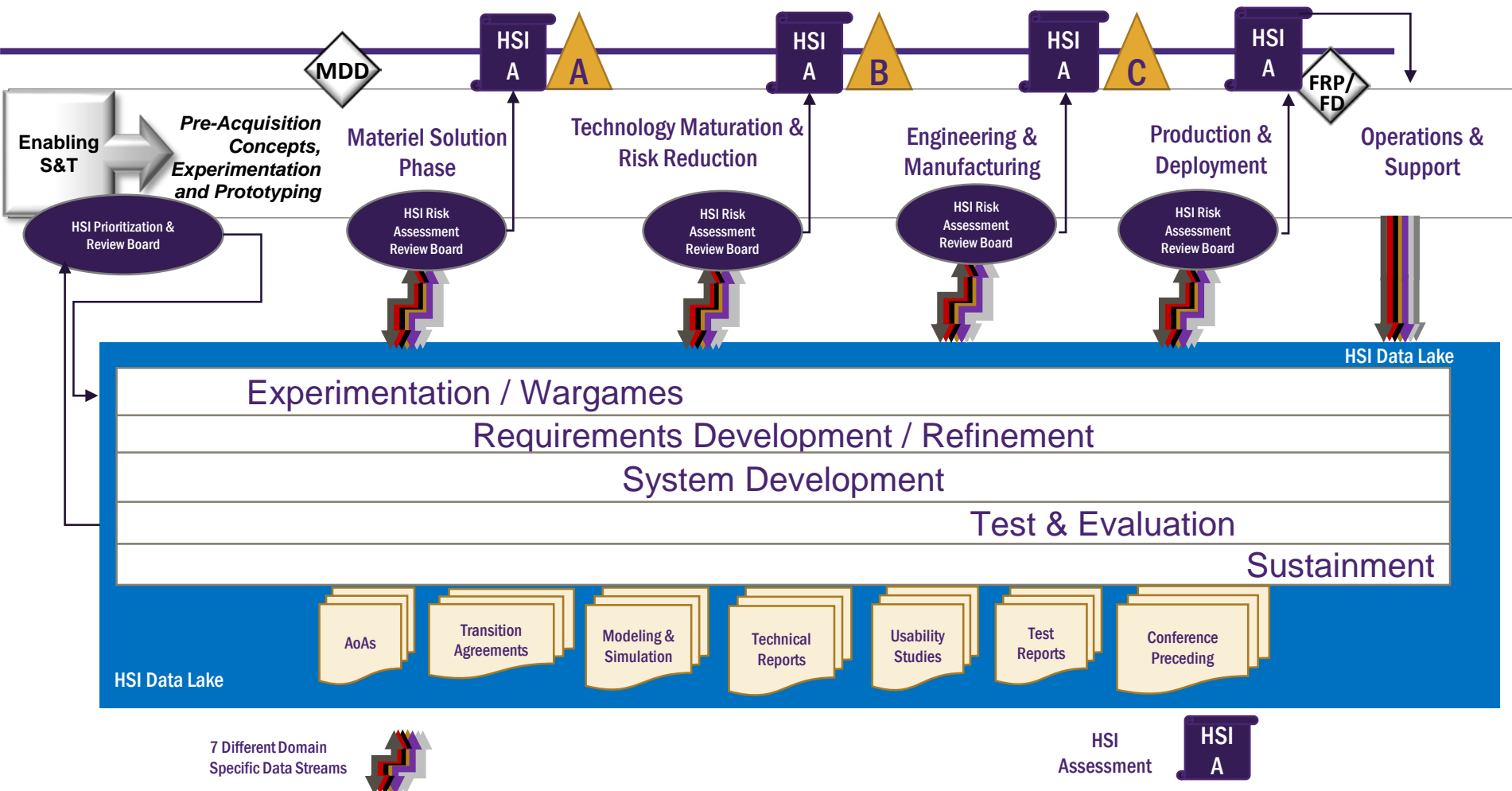
ARMY HSI DATA STREAM -- Current



Challenges & Gaps

- × Limited reporting and planning pre-MDD
- × Limited and inconsistent use of data, knowledge products, and warfighter events
- × Limited/no predictive ability to prioritizing HSI focus areas pre-MDD based on fielded system issues

Improved ARMY HSI DATA STREAM & REVIEW BOARD -- Proposed



Opportunities

- ✓ Full reporting and resourced informed decisions pre-MDD
- ✓ Holistic and consistent use of data, knowledge products, and warfighter events
- ✓ Predictive capability to prioritize HSI focus areas for during pre-MDD activities

Simplified HSI functions by Acq Phase (1 of 2)

A. S&T/R&D/Investments

- Participate in Tech Solution Down-select (S&T)
- Decompose JCIDS Requirements documents (PM, S&T)
- Lead/participate requirements elicitation & validation (PM, TRADOC CoEs)

B. Experimentation/Wargames

- Collect, analyze, plan for Human Performance Data (S&T, PM, ATEC)
- Develop and conduct Workload M&S artifacts (S&T, PM, TRADOC CoEs)

C. Requirements Development/Refinement

- Develop/Adjust KPP/KSAs (PM, ATEC)
- Develop/Adjust Critical Operational Issues Criteria (PM, ATEC)
- Conduct Usability Analysis (S&T, PM)
- Conduct Heuristic Evaluations (TRAC/CCDC DAC, PM)
- Conduct Product Reviews (PM)
- Conduct Literature Reviews (S&T, PM)
- Conduct Focus Groups & User Juries (S&T, PM, ATEC)
- Lead/participate in Field Experimentation (small scale excursions) (S&T, PM, ATEC)
- Participate in Trade Studies (i.e. AoAs)
- Conduct Task Analysis (S&T, PM)
- Develop Workflows (S&T, PM)
- Develop Personas, scripted scenarios & storyboards (S&T, PM)
- Conduct Human Figure M&S (S&T, PM)
- Conduct Workload M&S (S&T, PM, ATEC)
- Develop/Adj Request for Proposals (PM)
- Develop/Adj JCIDS Docs (PM, ATEC)

D. System Development

- Assist in Developmental Testing & Analysis (PM)
- Conduct Human Figure M&S (PM)
- Conduct Usability Studies (PM)
- Plan for and conduct Human-System Performance Analysis (PM, ATEC)
- Participate in Prototyping (PM)
- Conduct Product Reviews & Competitive Analysis
- Develop/Adj Systems Engineering Plan (PM)
- Develop HSI Plan (PM)
- Develop Wireframes (PM)
- Develop Process Maps (PM)

Simplified HSI functions by Acq Phase (2 of 2)

E. Milestone/Acquisition Decisions

- Participate in Tech Solution Down-select (i.e. Source Selection Boards)
- Conduct/participate in Sustainment Analysis (IMPRINT Maintenance M&S)
- Develop Source Selection Criteria
- Participate in Technology Readiness Assessments
- Inform/advise on Fielding Decisions
- Inform/advise on Technical System Reviews
- Author HSI Assessment (MS B, C)
- Assess System HSI parameters for Materiel Release

F. Test & Evaluation

- Provide HSI input to Test Plan Development
- Define HSI MOEs/MOPs for Test Evaluation & Data Analysis
- Partner in assessing Reliability Growth Analysis (PM, ATEC)
- Develop/Adj Test & Evaluation Master Plan (PM, ATEC)
- Conduct SME Reviews (ATEC)
- Lead/conduct Focus Groups, Interviews (PM, ATEC)
- Develop Analytical Questionnaires (PM, ATEC)
- Plan for the use of Empirical Questionnaires (ATEC)
- Participate in Customer Test (PM)
- Lead/plan for User Acceptance Testing (PM)

G. Sustainment

- Inform LCSP Update
- Inform Operational Supportability Analysis
- Inform Design Mod Impact Analysis (eg,ECPs)
- Collect/analyze Field Feedback & Corrective Actions
- Assess HSI during Logistics Demonstrations (Log Demo)
- Assess HSI as part of Integrated Logistics Assessments (ILAs)

HSI ASSESSMENT: A Management & Technical Process

HSI PRACTITIONERS

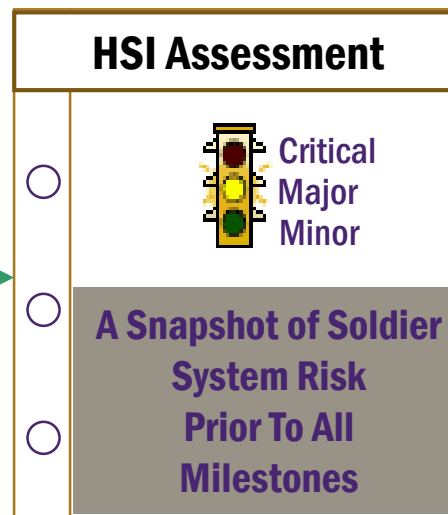
Independent Safety Assessment
U.S. Army Combat Readiness and Safety Center (USACRC)

Health Hazards Assessment Reports
Army Public Health Center (APHC)

Human Factors Engineering Assessment
CCDC D&AC, Formerly the HRED HSI

Manpower, Personnel and Training Assessment
CCDC D&AC, Formerly the HRED HSI

Soldier Survivability Assessment
CCDC D&AC, Formerly the Survivability/Lethality Analysis Directorate (SLAD)



**ASARC/MDA
ASA(ALT)**



Army

HSI Policy
Office



**PEOs and
PMs**

CCDC = Combat Capabilities Development Command
D&AC = Data and Analysis Center
ESOH=ENVIRONMENT, SAFETY & OCCUPATIONAL HEALTH
PESHE=PROGRAMMATIC ESOH EVALUATION
ASARC/MDA=ARMY SYSTEMS ACQUISITION REVIEW COUNCIL/MILESTONE DECISION AUTHORITY
ASA ALT=ASSISTANT SECRETARY OF THE ARMY, ACQUISITION, LOGISTICS, AND TECHNOLOGY
PM/PEO=PROGRAM MANAGER/PROGRAM EXECUTIVE OFFICER

