

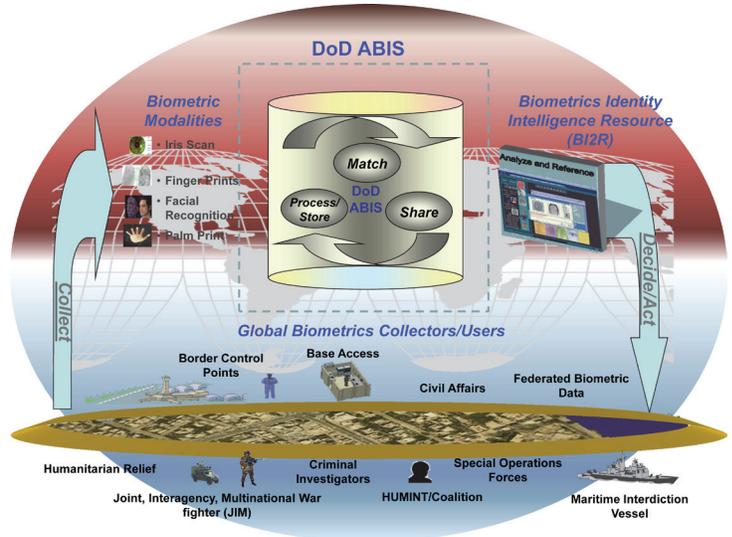
DoD Automated Biometric Information System (ABIS)

Executive Summary

- The DoD Automated Biometric Identification System (ABIS) 1.0 was fielded to the Biometrics Identity Management Agency (BIMA) in January 2009 as a quick reaction capability to support storing, matching, and sharing of collected biometric data primarily obtained during Operation Iraqi Freedom and Operation Enduring Freedom.
- The Army stood up a Program Management Office (PMO) in 2009 to foster the establishment of ABIS as a formal program of record to be known as the Biometrics Enabling Capability (BEC) Increment 0.
- In January 2011, USD(AT&L) issued an Acquisition Decision Memorandum establishing ABIS 1.2 as the baseline for the BEC 0 upon completion of a Full Deployment Decision (originally scheduled for FY11).
- Since 2010, there have been four failed attempts to deploy ABIS 1.2, all resulting in roll-back decisions.
 - In the most recent deployment attempt (August 2013), BIMA did not operate ABIS 1.0 and 1.2 in parallel. All users were forced to use only ABIS 1.2, which did not meet user needs.
 - Customers immediately reported significant operational impacts, but the roll-back to ABIS 1.0 did not occur until the tenth day of operations with ABIS 1.2.
 - U.S. Special Operations Command (USSOCOM) documented 31 high-priority deficiencies and U.S. Central Command (USCENTCOM) documented 11 additional high-priority deficiencies that affected mission accomplishment due to deficiencies in the ABIS 1.2 baseline.
 - The Director, Defense Forensics and Biometrics Agency (DFBA), the Executive Manager for Biometrics decided to restore ABIS 1.0 as the system of record. DFBA recommended that no further upgrade attempts be made until (1) requirements are refined and validated by the joint community and (2) all high-priority findings are addressed and fixes are acceptable to ABIS customers.
- ATEC performed a limited capabilities and limitations assessment on ABIS 1.0; however, no independent ATEC testing has been conducted on ABIS 1.2.
- Developmental tests to date have, for the most part, not been operationally realistic. The program needs to address deficiencies identified in testing to date and verify correction of those deficiencies in an operationally relevant environment before proceeding to IOT&E.

System

- DoD ABIS is an authoritative database that uses software applications to:
 - Process and store biometrics modalities (i.e., fingerprints, palm prints, iris scans, and facial recognition data) from collection assets across the globe



- Update stored records with new biometrics data
- Produce biometrics match results (against stored data)
- Share responses among approved DoD, interagency, and multinational partners, in accordance with applicable law and policy
- For biometric submissions that are unable to produce a match using automated processes, biometric examiners (subject matter experts) use ABIS workstations with specialized software to attempt to manually match submissions.
- ABIS interfaces with global biometrics data collectors and users, as well as outside databases.
 - Military Services and Combatant Commands collect biometrics data (fingerprint, palm print, iris scans, and facial scans) from persons of interest in the field using hand-held devices and submit that data to ABIS.
 - Intelligence analysts analyze and fuse biometrics information via the Biometric Identity Intelligence Resources (BI2R), an automated database outside the ABIS, and provide information back to the users in the field.
- Custom components include:
 - A transaction manager for managing customer submission workflows
 - A portal allowing authorized operators to perform user management, system configuration, real-time system monitoring, submission tracking, and report generation
- The U.S. Army BIMA currently operates ABIS on the Non-secure Internet Protocol Router Network (NIPRNet).
- The PMO is developing ABIS 1.2 as an enhancement to the current ABIS 1.0. The new system is intended to address hardware and software scalability limitations in ABIS 1.0. The PMO intends ABIS 1.2 to be an architecture that will enable increased throughput of biometric submissions.

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Mission

- Military Services and U.S. Combatant Commands rely on ABIS to provide timely, accurate, and complete responses indicating whether persons of interest in the field have a prior history of criminal activity, to assist in identifying potential threats to U.S. forces and facilities.
- The Federal Bureau of Investigation, the Department of Homeland Security, and the National Ground Intelligence Center interface with ABIS to identify biometrics matches in support of U.S. criminal cases, border control, and intelligence watchlists, respectively.

Major Contractor

Northrop Grumman, Information Technology
(NGIT) – Fairmont, West Virginia

Activity

- ABIS was first developed as a prototype in 2004 in response to a Joint Urgent Operational Need Statement (JUONS). ABIS 1.0 was deployed to BIMA in January 2009 as a prototype system to provide multi-modal and multifunctional biometric capabilities to assist in the Global War on Terrorism and subsequently in Overseas Contingency Operations.
- Since 2004, DOT&E has designated all biometrics programs be placed on the test and evaluation oversight list as pre-Major Automated Information Systems. As such, although not a formal program of record, ABIS is included on DOT&E oversight.
- In July 2009, USD(AT&L) designated the Army as the Executive Agent for Biometrics with responsibility for development, acquisition, and fielding of common biometrics enterprise systems to support joint DoD requirements.
- The Army, as the executive agent and the lead materiel developer for ABIS, stood up a PMO in 2009 to foster the establishment of ABIS as a formal program of record to be known as the BEC Increment 0.
- In 2009, ATEC conducted a limited capabilities and limitations assessment on ABIS 1.0.
- In January 2011, USD(AT&L) issued an ADM establishing ABIS 1.2 as the baseline for BEC 0 upon completion of a Full Deployment Decision (originally scheduled for FY11).
- Concurrent with attempts to transition BEC 0 to a program of record, the Army has been developing joint requirements for the BEC Increment 1 (BEC 1) Capabilities Development Document. However, requirements approval for the document is under further review due to concerns about affordability.
- The PMO attempted to deploy ABIS 1.2 three times from 2010 through 2012. In each case, the attempt was unsuccessful and the system was rolled back to the DoD ABIS 1.0 baseline.
 - After the first failed deployment attempt (November 2010), the PMO and BIMA executed two developmental tests (January and June 2011). The second developmental test was intended to verify fixes to defects discovered in the first developmental test. The PMO and BIMA said the tests were conducted in an operationally representative environment (using an operationally representative backup facility, operational biometric data, operationally representative use cases, and actual BIMA operators).
- The PMO attempted second deployment of ABIS 1.2 in August 2011. The program had intended to use ABIS 1.2 as the primary operational capability, and to monitor interoperability and operational availability, reliability, and maintainability during deployment; then address and fix deficiencies as they were identified.
- In August 2012, the PMO deployed ABIS 1.2 using a parallel operations test construct to compare capabilities of ABIS 1.0 against ABIS 1.2. The program intended to execute a broad range of operational use cases on both systems and compare results at each stage of the process; capabilities evaluated were the ability to match, store, share, reference, analyze, and manage biometric data in a timely, accurate, reliable, and usable manner. This third deployment attempt resulted in failure to meet exit criteria outlined in the Memorandum of Agreement between the PMO and the Deputy Director for Operations for BIMA conducting the DoD ABIS Parallel Operations Assessment.
- In December 2012, the PMO conducted a “customer” (developmental) test to determine if ABIS 1.2 enabled the operators to access the functions they needed to perform their duties and that the system would react with consistent, accurate, and useful reports, displays, or other responses.
- The PMO conducted a subsequent customer test April 29 through May 1, 2013, and a third customer test June 25-27, 2013, to verify correction of Severity 1 and 2 findings from the initial customer test.
 - The tests were conducted in a laboratory-like (not operationally representative) enclave with no external connectivity that would allow submissions to be received or responses sent out to the warfighter.
 - Independent subject matter experts were unavailable to support testing, and were not used to assess the validity of the use cases, test data, and results. There was also no attempt to perform regression testing.
 - The second test suggested that the defects from the first test had been fixed, but there was no testing performed to

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- determine if new defects had been introduced by the fixes to the program.
- In August 2013, the PMO deployed ABIS 1.2, which again resulted in a roll-back decision. During this deployment attempt, ABIS 1.2 was activated as the system of record directly supporting real-world operations.
 - In the previous deployment attempt, BIMA operated ABIS 1.0 and ABIS 1.2 in parallel. In the August 2013 deployment attempt, all users were forced to use only ABIS 1.2, which did not meet user needs.
 - Customers immediately reported significant operational impacts, but the roll-back to ABIS 1.0 did not occur until the tenth day of operations with ABIS 1.2.
 - USSOCOM documented 31 high-priority deficiencies and USCENCOM documented 11 high-priority deficiencies that affected mission accomplishment due to deficiencies in the ABIS 1.2 baseline.
 - Users noted suitability deficiencies, including the inability to locate data and an increase in the percentage of files requiring human review.
- As a result of the latest roll-back decision, DBFA recommended that no further upgrade attempts be made until:
 - Requirements are refined and validated by the joint community
 - All high-priority findings are addressed and fixes are acceptable to ABIS customers
- The August 2011 deployment attempt demonstrated operational shortfalls including system instability, inconsistent processing times, system congestion, transaction errors, and a 48-hour outage. Prior to that deployment attempt, a developmental test in January 2011 showed critical function failures, inadequately trained operators, and incomplete documentation. These defects were deemed fixed in a June 2011 developmental test, once again reflecting the lack of adequate developmental testing and lack of an operationally relevant test environment.
- The August 2012 deployment attempt revealed 10 Severity 2 and 35 Severity 3 deficiencies; however, the PMO focused on only 2 of the Severity 2 deficiencies when conducting the customer tests leading to the August 2013 deployment. Consequently, many of the same deficiencies arose during the August 2013 deployment, including degradation in match accuracy, unexplained discrepancies in results between the two versions, system congestion under routine load, transaction errors from incoming/outgoing external interfaces, and (once again) problems migrating identities from the ABIS 1.0 database into the new ABIS 1.2 database.
- During the August 2013 deployment, testing revealed that the interfaces between the current 1.0 system and its customers are not fully defined and documented. Interfaces have been created and sustained on an ad-hoc basis by BIMA in support of mission needs. Documentation of the interfaces and services provided by ABIS 1.0 and re-creation of those services in ABIS 1.2 will require close collaboration between operators and the system engineers responsible for the 1.0 and 1.2 systems.
- In addition to demonstrating significant shortfalls with ABIS 1.2, testing during the August 2013 deployment also revealed problems with ABIS supportability.
 - ABIS 1.0 authority to operate will be at risk due to its dependence on Windows XP®, which is being phased out. Significant Information Assurance vulnerabilities will not be patched if support for the Windows XP® product is curtailed by the vendor. Accordingly, ABIS 1.0 should be modernized to eliminate its dependency on Windows XP® and other hardware or software reaching end-of-life.
 - Should ABIS 1.0 be baselined, an assessment is needed of the ABIS 1.0 system, to include the definition of external interfaces to the current system and customers. Any script utilities that exist to enable end-to-end exchange should be defined, documented, and consolidated to the extent possible so that each interface can be maintained even as changes continue to be made to the core system.
 - The ABIS 1.2 system is also dependent upon Windows XP® and utilizes the same search core employed by the ABIS 1.0 system. For ABIS 1.2, both the Windows® operating system and the search core are planned to be updated starting in 1QFY14.
- Based on nearly five years of development and testing, ABIS 1.2 continues to experience a significant number of high-priority defects, which have not yet been addressed and

Assessment

- The results of the Army's 2009 capabilities and limitations assessment indicated that ABIS 1.0 successfully met BIMA performance and suitability requirements (subject to test limitations including lack of external connectivity preventing an assessment of operational interfaces and lack of independently administered surveys).
- The program established a pattern of "fixing" problems found in developmental testing, conducting developmental testing in a non-operational environment, and then failing in operational deployment. This pattern indicates an undisciplined software development, deployment, and maintenance process. The lack of requirements approved at the joint level, lack of a measured baseline system against which comparisons of the ABIS 1.2 can be made, and lack of mature configuration management processes have further exacerbated test adequacy and reporting concerns.
- The November 2010 deployment attempt showed failures to import the Biometrics Enabled Watchlist, failure to properly migrate all the data, and failure to migrate all identities. A prior Joint Interoperability Test Command assessment (September 2009) found that lack of a formal standards conformance program for the DoD Biometric enterprise resulted in a multitude of interoperability deficiencies. Two deficiencies – incorrect cross-linking of distinct identities and substantial errors during data ingestion creating a backlog in workload – were potentially related to the November 2010 results.

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verified to be fixed in an operationally realistic environment. Progression of ABIS into the BEC Program of Record will require resolution of problems with ABIS 1.2 deficiencies.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY13 Recommendations. The PMO should:
 1. Capture and report baseline performance measures of the ABIS 1.0 before attempting any further upgrades.
 2. Prior to IOT&E of ABIS 1.2, fix deficiencies identified in prior developmental testing and verify correction of fixes to include regression testing to assure that all critical functionalities are adequately tested in an operationally relevant environment. Additionally, testing should assess end-to-end exchanges with ABIS customers under various load and threat conditions; demonstrate adequate reporting tools, processes, and procedures for providing system health and monitoring metrics; and demonstrate suitable software maintenance procedures in an operationally realistic environment.
 3. Conduct an IOT&E of ABIS 1.2 to confirm operational effectiveness, operational suitability, and survivability.
 4. If ABIS 1.2 is not likely to successfully complete IOT&E by May 2014:
 - Consider utilizing ABIS 1.0 as the baseline system for BEC 0 to become a program of record
 - Modernize ABIS 1.0 to eliminate its dependency on Windows XP® and other hardware or software reaching end-of-life
 - Conduct a baseline assessment, to include the definition of external interfaces to the current system and customers
 5. Institutionalize a formal standards conformance program, listing external systems that have been independently verified to be interoperable with the biometrics enterprise.