Defense Health Agency Health IT Directorate | Innovation and Advanced Technology Development Division

IATDD Report

August 2015

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pg. 8 | Pacific JITC's Integrated Test and Evaluation Center
The Integrated Test and Evaluation Center (ITEC) is a facility aligned under the Pacific JITC in Kihei, Hawaii. The ITEC is the first DoD/VA integrated lab to virtualize critical legacy systems. This center provides an agile computing environment that supports military health and interagency research and development, testing and evaluation missions. Discover some of the research and initiatives that are taking place at the center.

pg. 10 | Geospatial Location and Intelligence
Geospatial location and intelligence can enable the MHS to plan critical missions and enhance force readiness by using collected data that provides products and services to decision-makers, Warfighters and medical personnel when they need it most. Read more about this technology's capabilities and potential benefits it brings to military health.

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DHA
Defense Health Agency

An update from...

Mark Goodge

Military Health System Chief Technology Officer

These are exciting times for military health as we prepare to wrap up Fiscal Year (FY) 2015 and continue to approach Full Operating Capability (FOC). I'd like to take a moment to highlight some of the many activities underway at the Innovation and Advanced Technology Development Division (IATDD). My team has been working diligently to continue to support the MHS Quadruple Aim and the MHS Strategic Plan for 2015-2020, as we continue to further our progress in research and innovation to support MHS beneficiaries and their families.

Aligning Incentives to Achieve Outcomes

The IATDD was tasked to lead the way for mobility efforts for the Defense Health Agency (DHA) and thus the Mobile Technology Working Group (MTWG) was stood up to be chaired by Execution Branch Chief, LTC Mark Mellott.

The group has continued to make great strides in defining the way forward for mobility efforts within DHA. Currently, the MTWG is in the process of defining functional, technical and business requirements and soon expects to be chartered under the Clinical Portfolio Management Board (CPMB).

Recently, the MTWG was briefed on the capabilities that DISA offers for mobile and how the DHA could utilize those capabilites in the future.

The group plans to utilize the data received and lessons learned to continue to define the future of mobility and work to align incentives to achieve outcomes that will enhance the services provided to the Warfighter.

To learn more about defining a way forward for mobile, be sure to check out Ms. Janine Oakley's briefing on mobility at the Defense Health IT Symposium (DHITS) later this month in Orlando.

Enhancing Medical Capabilities in a Joint Environment

IATDD is actively involved in the Joint Program Committee-1 (JPC-1) activities. The JPC-1 Medical Simulation and Information Sciences (MSIS) Research Program released a Program Announcement (PA) inviting all DoD employees to submit their ideas for research to close capability gaps at the MHS in the following areas:

- **Theater and Operational Medicine**: biosensors, telehealth technologies, physiologic monitoring
- **Medical Resourcing**:educational systems technologies, improved education delivery
- **Enterprise Infrastructure Management**: cloud computing, semantic interoperability, universal exchange languages
- **Healthcare Services**: personal health data analysis and monitoring, 'just in time' mobile training

By addressing these capability gaps, we can continue to progress in enhancing emerging medical capabilities in a joint environment to increase the readiness of our Forces.

For more information on the PA, visit www.health.mil/ITideaChallenge.

Representing Innovation at the Defense Health IT Symposium 2015

The Defense Health IT Symposium (DHITS) brings together participants from the MHS, DHA and Military Services Health IT community to provide a platform to interact and discuss strategic changes, direction, the concept of shared services, and initiatives of the MHS, DHA and new Electronic Health Record program.

The IATDD is honored and excited to be a part of DHITS in August and help represent the MHS and DHA to the IM/IT community as it relates to innovation.

Supporting the MHS Quadruple Aim

- Aligning incentives to achieve outcomes that improve care and health and lower cost
- Improving readiness through enhancing strategic partnerships and medical capabilities in a joint environment

DHITS not only presents a great opportunity for the IATDD to present our ongoing initiatives and accomplishments, but also presents an opportunity to identify innovations and technologies for military health through developing and enhancing strategic partnerships.

Some of the key items IATDD will be displaying include our Long Range Technical Architecture Strategic Plan, customer engagement process, transition process, ongoing and completed research efforts, and most importantly how to get involved and progress military health innovation.

Be sure to stop by the MHS exhibit area and visit stations 1-5 to learn more about IATDD. For more details about what the IATDD will exhibit at DHITS, check out page 5.

DHITS will also be hosting a number of briefings that present attendees the opportunity to hear more about the DHA and its' processes. This year IATDD is hosting the "Capitalizing on Emerging Technology" briefing track. Be sure to come to Bonaire 5-6 to learn more about how the MHS is working across the enterprise to implement innovation.

IATDD in the News

This summer the IATDD was featured in the Official U.S. Defense Department Science Blog, a FedTech Magazine Top 50 Must-Read Federal Government IT Blog. The article highlighted the division's participation at the Global City Challenge Expo.

The story features IATDD's role in the challenge and a discussion with Execution Branch Chief, LTC Mark Mellott, who discusses the significance of the Internet of Things and the steps that IATDD is taking to support that. To read the full story click here.

Thank you for taking the time to read this report, which I encourage you to share with your staff. I hope this report will help improve awareness of just some of the IATDD's ongoing initiatives that are supporting the improvement and maintenance of the health and wellness of our beneficiaries.

I hope fourth quarter is off to a great start for you and I look forward to working together to provide the best care for the brave service men and women who serve our great country.

V/R, Mark Goodge

IATDD at the Defense Health IT Symposium

The Defense Health IT Symposium (DHITS) provides a unique opportunity for military leadership to effectively and proactively communicate the DoD's strategy to modernize the Electronic Health Record (EHR), the collaboration efforts of the DHA's analytics capabilities and Service-level analytic assets, and our focus on providing the Services and DHA personnel with common executable goals. Be sure to stop by stations 1-5 at the MHS exhibit area to learn more about the areas outlined below!

Visit our Innovation and Advanced Technology Development Exhibit Pods at DHITS

MHS Pod #1
Transforming Business through Technology

Learn how Health IT (HIT) is combining strategy and analytics to implement roadmaps for Long Range Technical Architecture (LRTA) planning.

MHS Pod #2
Applying Advanced Technologies and Innovations

Discover HIT ideation efforts underway and how to play a role in identifying innovative ways to use technology to protect, support and advance the health and welfare of MHS beneficiaries. See how the IATDD works with the Request Portal and Governance to shape a concept for research execution.

MHS Pod #3
Transitioning Health IT Research

Understand the steps IATDD is taking to ensure research efforts are transitioned for use on the battlefield and in clinics. Hear about the Transition Workflow Process IATDD established and an overview of transition activities.

MHS Pods #4 and 5
Enhancing Military Health through Joint Research

Learn about existing initiatives underway at the Pacific JITC's Integrated Test and Evaluation Center to support DoD medical readiness and IT modernization needs. Hear about Pacific JITC's Biotechnology Hui and the applied research, development and deployment of telehealth and biotechnology activities.

DHITS Speaker Track #6
Capitalizing on Emerging Technology

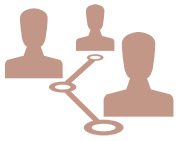
- **Defining a Secure Mobile Framework Architecture at DHA**
  Janine Oakley
- **Improving ESSENCE Risk and Cost through Joint Research**
  CAPT Paul Miller
  Dr. Robert Bell
- **Health IT Research: From Concept to Development**
  LTC Mark Mellott

Third Quarter APP Recap

The Annual Performance Plan (APP) Program serves as a tool for measuring accountability for effective use of government resources and overall portfolio management. In the Third Quarter of Fiscal Year 2015, the IATDD achieved all of its' APP goals. These goals were centered on DHA competency areas of information resources strategy and planning, IT project and program management, and leadership and human capital management.

Completed the HIT Research and Development (R&D) Catalog

Submitted the first version of the HIT R&D Catalog to Mr. Bowen to improve transparency on existing and planned research initiatives within the DHA to allow for increased collaboration and cost savings from the reduction in duplication of efforts.



LRTA Socialization Occurred with 11 Stakeholder Groups

Met with over 70% of enterprise stakeholders about the Long Range Technical Architecture (LRTA) Strategic Plan to increase understanding of where and how additional enterprise gaps can be addressed with future LRTA suggestions.

Initiated and Completed First Idea Generation Campaign

Launched a campaign targeting internal stakeholders addressing machine learning, using milSuite. The campaign resulted in an increased awareness from internal stakeholders of IATDD and set the stage to launch our future external facing campaign.

Developed a Transition Management Plan for Health IT Research

Defined and completed a transition management plan for all health IT research projects, pilots and initiatives to be transitioned into the enterprise for both knowledge and materiel solutions.

The APP Process Further Defined...

The APP process includes each HIT Division providing quarterly updates to the APP goals they are expected to meet in order to stay on target for the year. In the APP guidance document sent out by Chief Information Officer and HIT Director, David Bowen, it states that the APP and quarterly reporting process is intended to expand the integrated view of MHS health IT accountability and to more effectively facilitate performance improvement. Goals are also incorporated into the individual performance plans of leadership and staff.

» **Implementing Innovation at the Military Health System**
COL Daniel Kral
CAPT Paul Miller
Dr. Steve Steffensen
Andrew Jacobs

» **TeleHealth: Addressing Emerging Capability Gaps and Challenging Existing Doctrine**
COL Daniel Kral

» **Making the Connection: Social Media and Smart Phone Applications**
MAJ Matthew Barnes
TSgt Wardell Ross

Spotlight on:

Technology Provides Mission Critical Research, Risk Reduction and Actionable Information

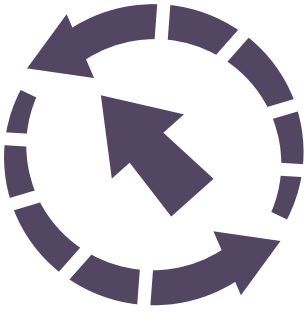
Imagine a system that has the capability to seamlessly deliver the power of information to stakeholders the moment they need it to make informed data-driven decisions. The Theater Barcode Integration and Commercial-Off-The-Shelf-based (COTS-based) Radio Frequency Identification (RFID) project focused on achieving this vision by applying modern technologies to better identify and track patients and the treatments provided from point-of-injury care through division-level facility care to improve overall quality care and health outcomes.

The purpose of patient identification and tracking in the MHS is to record injury or treatment information to ensure that the information associated with the patient is readily available to the next provider. Beyond the first point-of-care, a primary concern is accurately identifying the patient, so that his/her condition is not clinically compromised.

The current system used in theater is complex, non-standardized and is prone to failure. The Theater Barcode Integration and COTS-based RFID project aimed to implement a system that would function more effectively by leveraging advancement in RFID and the underlying architecture provided by a theater mobile computing platform by integrating the use of current barcoding in the clinical workflow.

RFID solutions support a broad range of functions like allowing healthcare personnel to capture data for medication administration, point-of-care testing, transfusion verification, specimen collection/tracking and patient charging.

The solution that was developed offers the ability to quickly and accurately identify a patient on demand to uniquely identify non-U.S. Military or unidentified casualties and track patient movements throughout the clinical workflow and different levels of care.



How does the RFID process work?

- During pre-deployment each Service member is issued an NFC chip to be attached to his or her dog tag
- The dog tag contains vital information including name, birthdate, social security number, blood type and allergies
- Encrypted information on the dog tag enables quick identification on the battlefield
- Medical personnel possess a mobile device and supply of NFC-enabled wristbands that are kept in their medical bag in the case of an unidentified casualty

Using RFID Technology at Different Levels of Care

Point-of-Injury Care

Scan tag to initiate encounter and record casualty time and location.

En Route Care

Record evacuation time and location. Add en route care note as needed.

Level 1: First Aid Posts Care

Record treatment information and write to tag.

Levels 2-3: Brigade and Division Level Facility Care

Point of injury information available upon arrival. Bedside patient identity verification.

"The solution that was developed offers the ability to quickly and accurately identify a patient on demand to uniquely identify non-U.S. Military or unidentified casualties and track patient movements throughout the clinical workflow and different levels of care."

The RFID concept requires the use of a mobile device to record point-of-injury data on the battlefield and near field communication (NFC) tags exist as wristbands and dog tag attachments.

During pre-deployment, each Service member is issued an NFC chip to be attached to his or her dog tag, which contains name, birthdate, social security number, blood type and allergy information.

This important identifying information is then encrypted and written onto the dog tag for quick identification on the battlefield.

Medical personnel are then issued a mobile device and supply of NFC-enabled wristbands to be kept in their medical bag in the case of an unidentified casualty.

This data collected can be stored and forwarded in a standard format to be consumed by current or future electronic health record (EHR) systems.

To test this proof-of-concept, participants of this project were engaged to provide feedback on concept demonstrations and the prototype's capabilities. The research and feedback provided drove an agile approach to refine the proof-of-concept, and was taken to the Pacific JITC Integrated Test and Evaluation Center (ITEC) to be tested.

Proof-of-concept testing concluded that the system functioned to address the capability gaps of the current system and successfully had the ability to identify a patient and their record treatment data, and securely transfer the data with the patient for a provider to read.

As a result of this project, the research and development team was able to accurately identify patients, reduce the rate of medical errors and enhance the delivery of comprehensive treatment information to enable providers to make informed data-driven decisions.

For more information about this project, email the Pacific JITC at PJITC@dha.mil or stop by stations 4 and 5 at DHITS.

Prototyping a Medical Planning and Readiness Solution

Before a Warfighter is deployed into combat, it is imperative to accurately assess his or her readiness to improve health outcomes and ensure a successful mission. The Medical Informatics Fusion Decision Support (MIF-DS) project is working to develop a prototype solution that incorporates important data elements from multiple sources into a single, focused data model to provide users with a comprehensive view of Air Force data relationships to better predict readiness.

Currently a user may perform a process to combine data from multiple sources into a single report that is a customized, labor-intensive process. Since there is no application interface to facilitate the necessary access to visualize the data in one database, this time consuming process must be done frequently.

The MIF-DS team will demonstrate, through research and prototypes, the capability of presenting comprehensive information to medical readiness planners and decision-makers in real-time to the Medical Operations Center (MOC).

The MOC is a key component of the military planning scene, where planners, commanders and operators work together to execute the Operations Plan. The MIF-DS solution will exhibit the capabilities and value of medical planning and readiness functionality to support and refine the Air Force medical readiness decision-making process.

MIF-DS research-based prototypes will present flexible, visual representations of Air Force Medical System (AFMS) readiness criteria and provide users with rules-based alerts on current readiness data. With a few mouse clicks, users will be enabled to explore, drill down, filter and report on deployment readiness at the level of the person, Air Force Specialty Code (AFSC), Unit Type Code (UTC), Unit and MAJCOM.

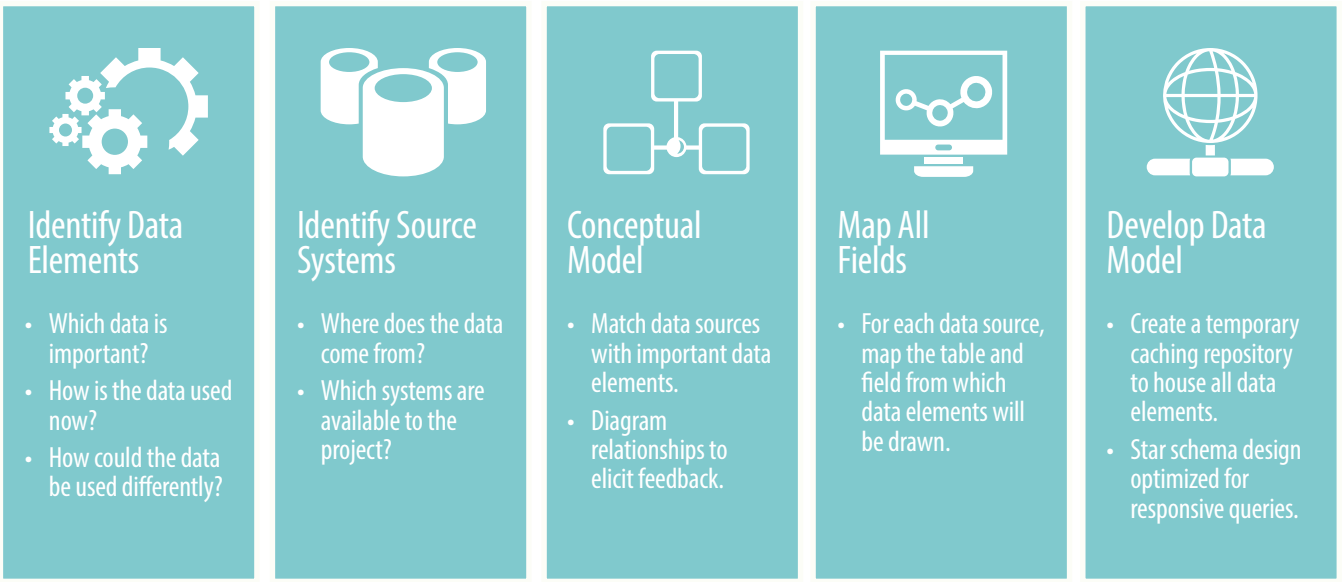
Specific readiness questions and what-if analysis will be supported with a dynamic search of all data in the MIF-DS tool. This prototype is looking to prove that AFMS readiness data can be delivered to planners and decision-makers in a flexible, performant, accurate and timely decision context for AF medical readiness planning, deployment decisions and deployment preparation.

The MIF-DS Data Model is scalable and designed to accommodate the expansion of the number of data elements and amount of data. The Data Model also uses industry standard optimization to quickly return queries on large data sets to improve response time. The Data Model can be easily

Benefits of Medical Informatics Fusion Decision Support

- Provide working, tested prototypes based on Air Force Medical System decision support use cases and scenarios to improve the effectiveness of decision-making
- Shorten the duration of data discovery and analysis to enhance the accuracy and timeliness of data presented and paint a more comprehensive picture of readiness factors
- Enhance the consistency of the data and its content

Medical Informatics Fusion Decision Support Process



taken down, transported and stood up in an alternate location.

The process of using the MIF-DS support tool consists of:

- Targeting data element requirements gathered from potential users, such as Unit-level planners, MAJCOM decision-makers and Surgeon Generals
- Identifying source systems
- Developing a high-level conceptual model to map data elements to the data sources where they are found
- Creating a comprehensive mapping of data elements to specific tables and fields in the source systems from which they will be extracted
- Establishing a data model to fuse all data extracted from each source to make it available to the presentation layer for user exploration

This project holds great promise for the MHS as it supports medical readiness planning and deployment preparation by enhancing accuracy and timeliness of readiness data, delivering a more comprehensive picture of readiness factors and improving the consistency of readiness data.

For more information about this project, email PJITC@dha.mil.

"With a few mouse clicks, users will be enabled to explore, drill down, filter and report on deployment readiness at the level of the person, Air Force Specialty Code, Unit Type Code, Unit and MAJCOM."

Spotlight on: Geospatial Location and Intelligence

When soldiers are on the battlefield in unfamiliar locations, it can be difficult to plan next steps and know any potential threats that may exist. With the development of geospatial and location intelligence (GLI) technology, the MHS can plan critical missions and enhance force readiness by using GLI data that provides products and services to decision-makers, Warfighters and medical personnel when they need it most.

GLI goes beyond 2D and 3D mapping by utilizing computerized geographic information systems (GIS) that capture, store, manipulate, analyze, manage and present all types of geographical data. GLI typically employs software that is capable of geospatial representation and processing, and applies analytical methods to terrestrial or geographic datasets.

Today in military health, GLI and its' GIS systems are aiding in intelligence gathering, supporting decision-makers and forecasting human activities. GLI has evolved into an important combat support tool and intelligence tool for the collection, analysis and distribution of geospatial intelligence for national security. It also aids in mapping Warfighter terrain, identifying geographic anomalies, planning security for major events and positioning remote communications technology.

The tremendous potential of GLI to benefit healthcare is just now beginning to be realized as the technology has started to go mainstream. As the uses of GLI expand and costs lower to implement the technology, it can support all aspects of the MHS Quadruple Aim to improve readiness, lower cost, deliver better care and enhance health.

For example, GLI can be remotely positioned to provide localized health information like access to water, food and healthcare. It is also aiding in the detection of global health hazards and threats to predict troops readiness for deployment and potentially dangerous situations.

GLI has the potential to have a great impact on operational medicine. Real-time tracking of personnel and resources combined with GLI technology can allow clinicians to efficiently control medical equipment and guide support personnel through any natural or man-made catastrophe.

With the capability to improve situational understanding for planning and response in advance of events, GLI systems can deliver threat deterrence and mitigation early in the response planning stages.

GLI holds great promise for the MHS and thus must be explored further as we strive to meet the MHS Quadruple Aim.

For more information on this technology email IATDD@dha.mil.

Knowledge Corner

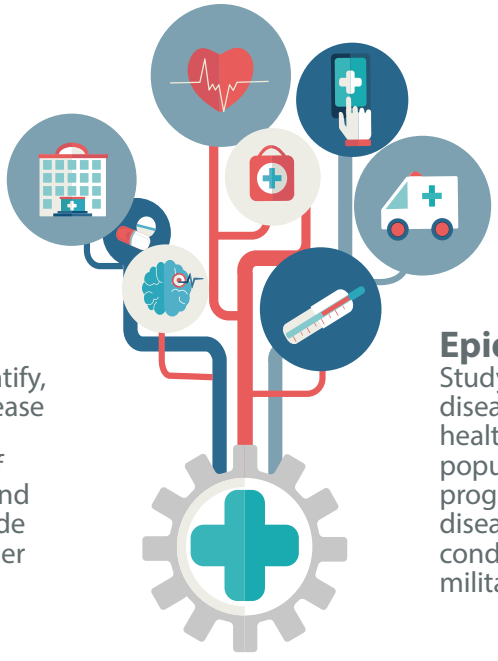
In an effort to interact with internal and external communities and expand our knowledge on emerging technologies, IATDD leadership recently met with the following entrepreneurs, industry and academia to learn more about technologies and innovations that are helping improve HIT for the way forward.

- IATDD leadership recently participated in a meeting with an institution from Academia to discuss a proposed education partnership agreement between the DHA and various academic institutions. The purpose of the proposed agreement is to **encourage and enhance study in science, mathematics and engineering disciplines**.
- An enterprise software company recently demonstrated a virtual mobile infrastructure to IATDD leadership. This infrastructure was co-developed with the DoD to **help enterprises separate the physical mobile device from sensitive enterprise apps and data hosted in the cloud**.

Major Mission Support Areas of GLI

Disease Surveillance

Provide predictive early indications of infectious disease outbreaks; identify patterns, relationships and current trends that influence population health through disease risk models; provide global public health officials critical information to improve containment.



Medical Intelligence

Data collection and analysis to identify, assess and report on infectious disease risk that can degrade effectiveness of deployed forces; identification of trends on environmental security and environmental risks that can degrade force health; collaboration with other agencies and stakeholders.

Epidemiology

Study the patterns and effects of disease conditions in public population health and military associated populations; coordination of a global program of military relevant infectious disease surveillance and identify conditions of interest diagnosed in the military healthcare system.

Geospatial Location and Intelligence | Defined

GLI is defined as data, information and knowledge gathered about entities that can be referenced to a particular location on, above or below the earth's surface. GLI then exploits geospatial data and information to describe, assess and visually depict physical features and geographically references activities on the terrain.

- IATDD Director, Mark Goodge, participated on a panel titled "Connected Devices Centric" at the Washington, D.C. Chapter's Armed Forces Communications and Electronics Association's Health Summit. The panel discussed **wearable devices, mobile and web applications, and the factors driving or holding back adoption by both providers and patients**.

- The IATDD team continued socializing the Long Range Technical Architecture (LRTA) Strategic Plan and met with Army leadership. The meeting served as a great way to discuss the **methodology of the LRTA, future state goals and a plan for implementation to provide tangible benefits to the DHA and the Warfighter.**

At a Glance

The IATDD is actively engaged with HIT Divisions and DHA stakeholders. Here we briefly highlight some of the recent and ongoing activities. To learn more about any of the below or how to get involved, please contact IATDD@dha.mil.

Define Mobile Course of Actions (COAs)
to continue to plot the way forward for mobility for the MHS.

Define a HIT R&D Transition Communications Plan
to relay the process for transitioning research initiatives to the enterprise.

Prepare for the Joint Defense Health Program/Veterans Affairs Medical & Information Sciences Review and Analysis
to discuss MHS projects and a roadmap for reducing research redundancies and closing functional gaps.

Release version 2.0 of the HIT R&D Catalog
to increase transparency on existing and planned HIT research initiatives.

Collaborate with the Research, Development and Acquistion (RDA) Directorate
to link HIT R&D efforts, processes and analytics.

Initiate a second idea generation campaign
to target internal and external stakeholders in support of the Better Buying Power (BBP) 3.0 memorandum.

Finalize the interagency agreement for the VA Veterans Health Information and Technology Architecture (VistA) Metadata Modernization
to further strengthen strategic partnerships to improve readiness.

The IATDD Report

provides information on the division's processes, projects, technologies and stakeholder engagements.

We hope this level of transparency with our partners across the directorate and agency contributes to increased knowledge sharing and risk reduction activities.

The views and opinions expressed are not necessarily those of the DHA Chief Information Officer or DoD.

To view a copy of this report or to explore the topics discussed in more depth, visit our SharePoint site at https//info.health.mil/hit/iat or click any of the SharePoint icons in this report to connect directly.

Submit your story ideas or provide feedback to the IATD Report Team via email at IATDD@dha.mil.