## Research, Development, & Evaluation of a Simulated Theater Cloud-based Architecture Supporting Multiple EHR Systems

At the end of FY18, TATRC's Medical Intelligent Systems Lab (MISL) successfully completed its research of a JPC-1-funded three-year Medical Cloud Connectivity for Combat Casualty Care (MC5). MC5 supported a number of related projects all aimed at enhancing the support to the Combat Medic generating and making available to deployed medical treatment facilities an electronic DD 1380 / Tactical Combat Casualty Care (TCCC), which facilitates tele-consultation between the Combat Medic and the Advanced Medical Provider. These projects included:

#### Phase I

- Support for the Air Force Research Laboratory's BATDOK (Battlefield Assisted Trauma Distribution Kit)
- Support for the Medic Smartphone Project
- Support for the Cross Domain Project
- Distribution Observation Kit) medic casualty tracking and trending application
- Research, development, and evaluation of an Enterprise & a Tactical Cloud environment
- Research and evaluation of the Health Assessment Light Operations (HALO) application
- Research, development, and evaluation of electronic DD 1380 compression algorithm
- Research and evaluation of transmitting electronic DD 1380 across Iridium satellite phones
- Research and evaluation of Tempus Pro in a large scale USMC RIMPAC Exercise
- Research and evaluation of BATDOK in USMC International Bold Alligator Exercise
- Research and evaluation of 4G LTE for Point of Injury and Role 1 support
- Research and evaluation of Secure Wi-Fi for Role 2 and Role 3 facilities

### Phase II

• Research and evaluation of the Combat Medic Data Cloud (CMDC)

Phase two of the MC5 project was initially planned to develop a prototype simulated Theater cloud-enabled MHS Genesis architecture using tactical communications and to conduct a field evaluation to see how well MHS Genesis would work in the tactical field environment. Unfortunately, TATRC was unable

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TATRC, working with Nexsys Electronics, Inc., researched, designed, developed, and field-evaluated a solution which addressed the gaps for a multi-EHR cloud architecture which supported various TATRC EHR related projects called the Combat Medical Data Cloud (CMDC). The CMDC was built on the existing core infrastructure of the contractor's Tele-Radiology system in order to have the system "accreditation ready" when complete. The CMDC supports a variety of functions to include:

A central web page where users can access any of the cloudbased applications.

Design and develop a digital DD 1380/TCCC Card Catcher's Mitt to receive digital TCCC cards from the three DD 1380 / TCCC application developer's TATRC is working with: TATRC/ MC4, Joint Operational Medicine Information Systems (JOMIS), and Air Force Research Lab.



Once the electronic DD 1380 is passed to the Catcher's Mitt application, the application places the data into its database where it is later parsed so that it is in a digestible format for the AHLTA-T and the Cerner Millennium Sandbox to ingest. Additionally, if a casualty has radiology images in the Tele-Radiology system, those images are accessible from the Catcher's Mitt through a tab that is displayed.

# TATRC TIMES



#### Tempus Pro device



In order to use the Tele-Radiology system as the basis for the CMDC, the Tele-Radiology system needed to be converted to a cloud-based architecture.

The third cloud-based application is the Remote Diagnostic Technology (RDT) Ltd, Corsium Suite, which enables advanced medical providers access to view any of the Tempus Pro devices that are in use at the time where the Tempus Pro device is transmitting to the Corsium Suite. Providers can view multiple devices at a time, or multiple providers can access the same Tempus Pro device for a group consultation.

The CMDC infrastructure not only supports these cloudbased systems, but it is easy to add additional web applications to the cloud and have them accessible as well.

Lastly, the CMDC has a variety of specialized utilities that provide detailed tracking of the data being pushed into the AHLTA-T or Cerner Millennium Sandbox, as well as user access management.

Mr. Tom Bigott, Project Manager from MISL stated, "The overall Combat Medical Data Cloud provides an easy to use interface simplifying the end user's requirements for accessing numerous web based applications in the cloud. Based on the



Patient Administrator (PAD) view, which includes summary data and an injury location diagram for all incoming casualties. This view would give administrators and clinicians at deployed MTFs a quick but comprehensive view of incoming casualties, with the ability to drill into more details as needed.

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The detailed view displays is a concise "side by side" view of the TCCC card so the entire card can be seen on screen without scrolling or clicking through tabs.

success of this project, an additional project was funded by JPC-1 to develop a secure tactical medical data cloud."

TATRC's MISL is currently in the process of transitioning this project to the JOMIS program office.