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QUARTERLY NEWSLETTER FOR THE BIOMETERICS DOMAIN

NIEM

Editor's Note

Welcome to your National Information Exchange Model (NIEM) Biometrics Domain newsletter. This publication provides Domain members with situational awareness of the latest features and related news of the Biometrics Domain, and enhances the exchange of intelligence and information across the Domains. Domain members represent the full range of operations that deal with gathering, analysis, fusion, and dissemination of biometrics intelligence. Our readers represent a broad audience of decision makers and stakeholders, as well as practitioners of the NIEM Biometrics Domain. This newsletter presents notable changes and current work in the Biometrics Domain. This specific issue covers topics such as the NBAC ET3 Updates, NIEM 5.0 Release and Harmonization, NIST DNA Standards, ANSI/NIST ITL NIEM Update, DoD EBTS Update, DHS/OBIM's Human Language Technology, and Automated Facial Recognition Technology information.

About the NIEM Biometrics Domain

The NIEM Biometrics Domain is a data model of agreed upon terms, definitions, and formats. It supports information sharing and promotes interoperability between mission-based organizations engaged in activities such as homeland security, national defense, border management, immigration benefits, and global law enforcement through the joint development and alignment of Extensible Markup Language (XML) Biometric Standards. The NIEM Biometrics Domain was launched in July 2012 and functions under the stewardship of the Office of Biometric Identity Management (OBIM) within the Department of Homeland Security (DHS). OBIM transitioned to the DHS Management Directorate after passage of the Cybersecurity and Infrastructure Security Agency Act of 2018.

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The Biometrics Domain operates under the oversight of its executive committee, which includes:

Chair: John Boyd (OBIM)
Co-Chair: Jennifer Stathakis (DOJ/FBI)
Co-Chair: William Graves (DoD)
Ombudsman: Diane Stephens (NIST)

NBAC Emerging Technologies Tiger Team (ET3) Update

The ET3 team is working with the modeling team at DHS Science and Technology (S&T) discussing topics like Artificial Intelligence (AI), Internet of Things (IoT), and Big Data. One of the deliverables the ET3 is planning on as an outcome of this effort is a common vocabulary and framework for Big Data. ET3 is planning on making this meeting a recurring one after the kick-off. If any agency is interested in participating, please contact Mr. Stephen Sullivan: stephen.m.sullivan14.ctr@mail.mil.

For additional information, contact the NIEM Biometrics Domain Team at:
OBIMFuturesIdentityNIEM@obim.dhs.gov

NIEM 5.0 Harmonization

The NBAC/NTAC is organizing the harmonization working group's weekly meetings as they gear up for the NIEM 5.0 major release next year. Open issues are tracked in the NIEM Releases GitHub repository at https://github.com/NIEM/NIEM-Releases/projects/3.

Key approved items currently include: 1.) The Justice and Screening domains both define warrant information. Warrant category appears in both domains, both of them being candidates for harmonization. 2.) The Screening domain has two augmentations (PersonNameAugmentation, PersonNameTextAugmentation) defined for NIEM Core PersonNameType. The recommendation is to merge these two augmentations into one augmentation by retaining PersonNameAugmentation. 3.) Harmonize area-related elements and GML (Geographic Markup Language) adapters across NIEM Core, MilOps domain, and Maritime domain. Area element names should also be updated for consistency reasons.

Issues for further review include: 1.) Harmonize and simplify person employment information. 2.) Review elements not used by any domain in the NIEM Core. 3.) Consider additional GML adapters.

About the NIEM Release 5.0

NIEM 5.0 major release will be published in fall 2020. It will include new and harmonized content for Core, domains, and code tables. It integrates Core Supplements 4.0.1 and 4.0.2 and will incorporate new architectural changes from the upcoming NIEM Naming and Design Rules specification version 5.0.

The NIEM 5.0 Alpha release accepted feedback on proposed changes until April 15, 2020. NIEM 5.0 Beta release will harmonize and refine Alpha changes, accommodate smaller content submissions, code table updates, and address new requests if possible, slated for the end of May 2020.

The NIEM 5.0 release candidate is slated for the end of August 2020 and will perform quality assurance and subsequent bug fixes. New requests affecting the NIEM 5.0 release at this time will be queued for the subsequent release. The NIEM 5.0 final published release and update of NIEM tools accordingly (SSGT, Movement, Migration Tool, ConTesA) is planned for fall of 2020.

ANSI/NIST ITL NIEM Update & Tool

The American National Standards Institute (ANSI)/National Institute of Standards and Technology (NIST) Information Technology Laboratory (ITL) specification number 1-2011 Update: 2015 is NIEM 4.01 compliant.

NIST has developed a tool at https://www.nist.gov/programs-projects/ansinist-itl-standard to assist migration and mapping between ITL versions of NIEM 2.1 and NIEM 4. Users are requested to utilize the tool and provide any comments back to biometrics-editor@nist.gov.

Upcoming NBAC Monthly Teleconference:

- **May 28, 2020, 1:00pm – 2:00pm**
- **June 25, 2020, 1:00pm – 2:00pm**

DoD EBTS Update

The Project Management Office for the U.S. Department of Defense Biometrics (PM DoD Biometrics) established a fully NIEM-conformant process and Information Exchange Package Documentation (IEPD) package in support of their mission operations. To achieve interoperability, the DoD uses the Electronic Biometric Transmission Specification (EBTS) as a transmission specification between DoD systems that capture biometric data. DoD EBTS v4.1 is NIEM 4.2 compliant based on the ANSI/NIST ITL specification number 1-2011 Update: 2015.

The Biometrics Interoperability and Standards Compliance Office (BISCO) Laboratory was established to support PM DoD Biometrics to conduct testing and evaluation of current and emerging biometrics capabilities. The BISCO conformance process was defined to support EBTS v4.1 and EBTS v1.2 and has been validated by the Joint Interoperability Test Command (JITC) to conduct standards compliance testing for the EBTS Standard. BISCO and PM DoD Biometrics are also working on a certified product list which would provide an authoritative list of biometric products that are EBTS 4.1 conformant. Handheld devices integrated at BISCO:

- Sciometric Slapshot which performs fingerprint and facial capture using a Commercial off-the-shelf (COTS) Android cell phone.
- Fully Contactless Tascent MX which performs fingerprint, facial, and iris capture using a COTS Samsung Galaxy S8, 9, 10 etc. cell phone, and a single COTS interface sled.
- Tascent Insight One which performs face and iris capture within seconds using a single interface, available over networked application programming interface (API).
- DevTech Windows Platform which performs face, finger, and iris capture using a fully integrated interface built around a windows tablet.

ISO DNA Standards

The International Organization for Standardization (ISO)/IEC JTC Subcommittee (SC) 37 is chaired by Mr. Patrick Grother of NIST. Working Group (WG) 3 of SC37 is the international collaborative working group focused on "Standardization of generic biometric technologies pertaining to human beings to support interoperability and data interchange among applications and systems." The mission of the SC 37/WG3 is to ensure a comprehensive and high-priority worldwide approach for the development and approval of international biometric standards. The SC 37 is made up 6 WGs, and each carries out specific tasks in standards development within the field of biometrics. There are 27 participating member countries in SC 37 and 20 observing member countries. During the January ISO meeting, the U.S. National Body (NB) of experts presented their comments and recommendations to the SC 37/WG3 chair in response to a working draft request for review of proposed DNA standards by SC 37 members. The editor of the DNA standard will incorporate U.S. NB recommendations into the document and recirculate the standard prior to the ISO virtual meeting in July 2020.

Human Language Technology

The exponential growth of the Web and the superior advancement in computing power in the last decade have led to a strong need to research how Human Language Technology (HLT) can aid in Identity Management. HLT is an interdisciplinary field that includes the following key technological and scientific areas:

- Computer speech recognition and understanding
- Natural language processing
- Text-based information retrieval
- Web-based dialogue agents

Dr. James Wayman, a biometric expert at OBIM, provided an HLT brief to OBIM on February 13, 2020 with these key points:

- Automated and machine-aided voice recognition has been an area of U.S. Government-funded research since at least Word War Two.
- In the U.S. automated voice recognition is conducted only for investigative and intelligence purposes and not for courtroom purposes.
- A basic speech processing problem involves recognizing voices with changes in the microphone type, background noise, compression or transmission channel.
- The sound spectrograph, or "voiceprint," was originally applied in the 1940s to problems of military interest to trace the movements of enemy personnel through interception of radio telephone conversations in association with direction finding.

Spectrographic voiceprints are no longer used in speaker recognition technology. Rather, modern systems start with "Cepstral Coefficients," or numbers derived from the frequencies in short-duration (32 msec) speech segments. These Cepstral Coefficients can be used to recognize speakers regardless of what is being said, or recognize what is being said regardless of who is speaking.

Automated Facial Recognition Technology

Facial recognition technology (FRT) compares facial images for recognition, including identification and authentication use cases. FRT determines whether the image contains a face, and in laboratory prototypes can estimate certain attributes such as gender and age.

OBIM is currently researching the possible use of FRT in improving the accuracy, quality, usability, interoperability, and consistency of identity management. OBIM, in conjunction with NIST, is working to develop and advance acceptance of a Face Image Quality Assessment Standard such that FRT can be used as an additional modality in Identity Management.

Dr. James Wayman provided these key points in a FRT briefing to OBIM on February 11, 2020:

- Government funding for automated facial recognition research reaches back to the 1960s. That early work focused on manually finding "anchor points" on the face (eyes, mouth corners, eyebrows) for computer-based comparisons.
- Automated eye-finding algorithms became available in the 1970s and are still implemented in many algorithms, particularly for pose estimation and correction.
- Current AI-based algorithms do not find "features" in the sense of eyes, nose, and mouth, but use generic image processing techniques to learn how to distinguish faces by examining millions of "mated" and "non-mated" facial image pairs.

We appreciate your input! Email us with comments and suggestions at:

OBIMFuturesIdentityNIEM@obim.dhs.gov