SOFTWARE ENGINEERING

The office of Systems Engineering and Architecture (SE&A) applies engineering expertise to advance DoD software engineering practice in support of the warfighter. SE&A Software Engineering engages with partners in government, industry, and academia to improve defense software expertise and leads initiatives to build excellence and professionalism in the defense software engineering workforce.
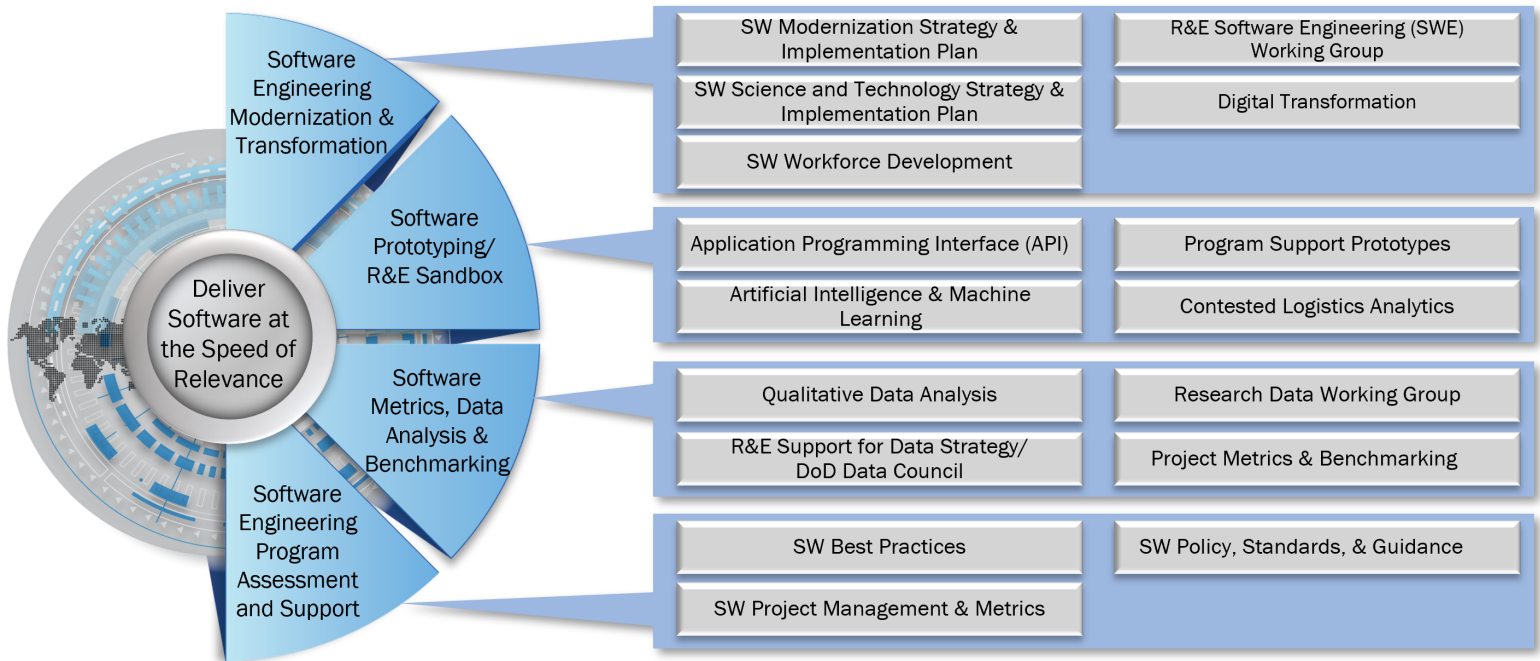

Figure 1. Enabling World-Class Software Engineering, Development, and Delivery

❖ KEY SOFTWARE ENGINEERING INITIATIVES

SE&A Software Engineering seeks to advance DoD software engineering practice with modern approaches (Figure 1). Software Engineering is engaged in two key initiatives:

Application Programming Interface (API) Technical Standards. Interoperability is crucial to joint warfighting, achieving artificial intelligence (AI) superiority, and leveraging modern software architectures and implementations. An API first strategy will allow the Department to enhance its ability to deliver new and innovative capabilities at the speed of need. The API Tiger Team publishes and updates technical guidance for implementing APIs, including cybersecurity, governance, design, and implementation.

DoD Software Science and Technology (S&T) Strategy Implementation. The Department published the strategy in November 2021. Software Engineering is leading development of an Implementation Plan (I-Plan) to coordinate software S&T activities across the Services and DoD. The I-Plan facilitates adoption of an integrated framework and aligns software S&T with acquisition.

❖ SOFTWARE WORKFORCE DEVELOPMENT

SE&A Software Engineering manages the Digital Talent Management Forum (DTMF) for OUSD Research and Engineering (R&E), which tri-chairs the monthly DTMF with OUSD Acquisition and Sustainment (A&S) and the Chief Digital and Artificial Intelligence Office (CDAO). The forum includes 400+ members from 48 DoD organizations. The DTMF supports the DoD Cyber Workforce Framework (DCWF), for which OUSD(R&E) has led development of eight Software Engineering Work Roles. For more information, see the DCWF website: https://public.cyber.mil/wid/dcwf/

ORGANIZATION HIGHLIGHT:
SOFTWARE ENGINEERING cont'd

SE&A LOEs

LOE 1 — Advance the Engineering Practice
- Assess MOSA Implementation
- Publish MOSA Implementation Guidance

LOE 2 — Connect & Strengthen the Technical Community
- Bimonthly MOSWG & Tiger Teams
- Partner with A&S, DSPO & DLA

LOE 3 — Develop the Workforce
- DAU CLE 019 Updates
- DAU MOSA CoP Modernization

LOE 4 — Advance and Manage Standards
- MOSS DSPO Updates
- Standards Identification

LOE 6 — Provide Systems of Systems (SoS) Architecture
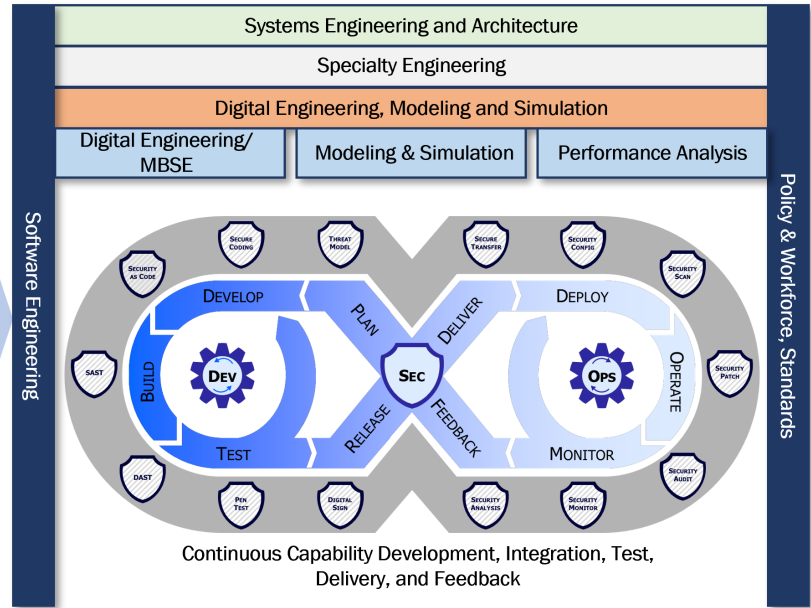- Interface Repository & Architecture Identification
- MILDEP Collaboration

Figure 2. SE&A Lines of Effort Supporting Software and Systems Engineering

❖ INITIATIVES

SE&A Software Engineering supports SE&A Lines of Effort (LOEs) from a software perspective, as software engineering plays a role in all aspects of program development (Figure 2). SE&A is exploring ways to improve digital engineering and model-based systems engineering (MBSE) and is leading efforts to improve cybersecurity. Teams use parametric modeling, software metric analysis, and data quality analysis to enhance DoD's visibility into contested logistics.

❖ RESOURCES

OUSD(R&E) SE&A Library: https://www.cto.mil/sea/pg
- ° Software Engineering for Continuous Delivery of Warfighting Capability
- ° DoD Software Science and Technology Strategy
- ° Acquisition Programming Interface (API) Technical Guidance

CIO Library: https://dodcio.defense.gov/library/

OUSD(R&E) SE&A: https://www.cto.mil/sea

Email: osd-sea@mail.mil | Attn: Software Team

❖ COLLABORATION

SE&A Software Engineering collaborates with multiple organizations throughout DoD and plays a leading role in the following:

- Digital Talent Management Forum
- DoD Application Programming Interface (API) Tiger Team
- DoD Software S&T Strategy Senior Steering Group
- OUSD(R&E) Engineering Data Working Group
- OUSD(R&E) Software Engineering Working Group
- Software Modernization Action Officer Working Group
- Software Modernization Senior Steering Group

Digital software engineering enhances efficiency, accuracy, resiliency, and speed.