Developing a Digital Engineering Body of Knowledge (DEBoK) for the Department of Defense (DoD)

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NDIA Abstract

The Digital Engineering Body of Knowledge (DEBoK) will serve as a reference for the DoD engineering community to use in implementing digital engineering practices; starting with systems engineering and expanding to specific disciplines, engineering domains and specialty areas. The BoK will store collective data, information and knowledge on digital engineering. Members of the government, industry and academia working within this space will be able to contribute to the DEBoK and build their digital engineering solutions based on collective knowledge.

The DEBoK contains a set of concepts, terms, and activities pertaining to a discipline as identified by a community of practice. It will include an interactive environment for stakeholders to digitally navigate pathways of content within an enterprise or on a program. Users will have access to a digital 'Starter Kit', which will help them execute activities within an enterprise or a program.

The DEBoK will focus on implementing digital engineering, to include the underlying fundamentals, enablers, guidance and examples. The DEBoK also will provide a basis for training to further support the deployment of digital engineering capabilities.

This presentation will discuss the approach used to develop the DEBoK. It will provide an overview of the 'Plan of Action and Milestones', significant deliverables from milestone activities, best practices and lessons learned based upon DEBoK implementation.

Project Overview

BoK defined in context “BoK plus”

A complete set of concepts, terms and activities pertaining to a discipline as identified by a community of practice and includes an interactive environment* for stakeholders (e.g., specified pathways, user roles, etc.) to digitally navigate pathways of content within an enterprise or on a program.

- *Philomena Zimmerman and Thomas Simms*

BoK plus aspect of the definition focuses on the “interactive environment” concept

DEBoK

Digital Engineering Body of Knowledge

DEBoK Definition, Vision, and Scope

Vision

Provide a digital instantiation of authoritative resources for the DoD engineering community to use in implementing Digital Engineering (DE), starting with systems engineering and expanding to specific disciplines, engineering domains, and specialty areas.

- Systems Engineering (SEBoK)
- Software Engineering (SWE BoK)
- Modeling and Simulation (ModSim BoK)
- Manufacturing and Quality (M&Q BoK)
- Cyber Resilient Weapon Systems (CRWS-BoK)
- Reliability and Maintainability (R&M BoK)
- Human Systems Integration (HSI-BoK)
- SE Modernization (SEMod BoK)

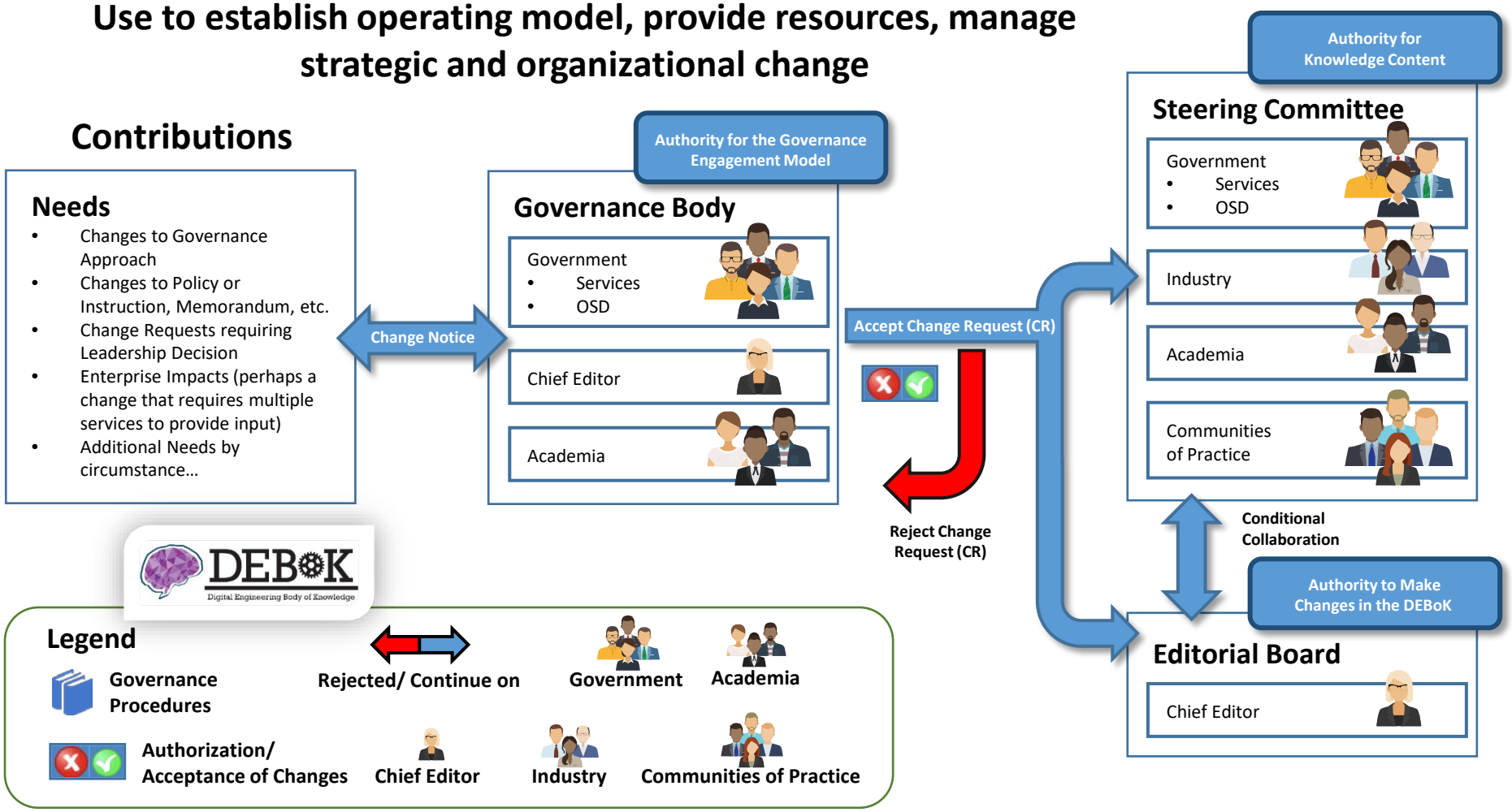
Scope

Focus on topics relative to implementing Digital Engineering to include the underlying fundamentals, enablers, guidance, and examples. The DEBoK will serve the Defense Enterprise (industry, academia, and government) by providing:

- Access to best practices
- Access to a community of practitioners
- Accepted terms and definitions
- Collaboration environment
- Publicly available content
- A basis for training

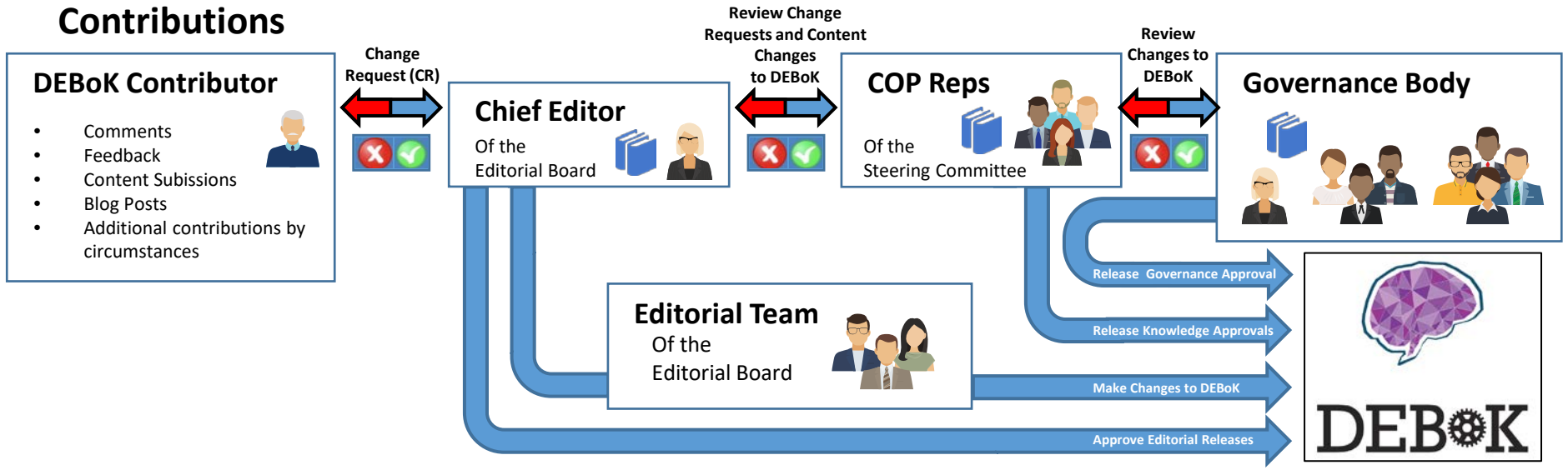
DEBoK Macro Level Governance

Use to establish operating model, provide resources, manage strategic and organizational change



DEBoK Micro Level Governance

Use to administer, sustain, and manage the DEBoK



Legend

- Governance Procedures
- Rejected/ Continue on
- Government
- Editorial Team
- DEBoK Contributor
- Authorization/ Acceptance of Changes
- Chief Editor
- Industry
- Communities of Practice
- Academia

Establish, sustain, grow, and manage the Digital Engineering Body of Knowledge

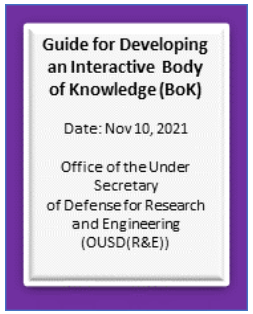
Planning and Implementation Approach

Planning & Governance

Community-Driven Planning

Deliverables:

- ✓ Terms of Reference (ToR)/ Charter
- ✓ User Role Pathways/Structure
- ✓ DEBoK Functions/Input Template(s)
- ✓ DEBoK Governance
- ✓ DEBoK TT Report



Input Templates

- Contracting Language
- Ecosystem & Tools
- Glossary
- Training
- Lessons Learned
- Best Practices
- Success Story
- Process Improvement
- Innovation
- Policy – Directive
- Policy – Issuance
- Policy – (Directive-type) Memorandum
- Policy- Instruction
- Policy – Manual

Implementation

Community-Driven BoK

Deliverables:

- ✓ Progress Reviews
- ✓ Select DEBoK Platform
- ✓ Starter Kit
- ✓ Establish DEBoK
- ✓ Beta Release of the DEBoK
- ✓ Pilot DEBoK
- IOC
- Public Access DEBoK

DEBoK
Digital Engineering Body of Knowledge

Lessons Learned Template

Basic Info

1. Date
2. Topic
3. Point of Contact (POC)
4. Category

Key Lesson

1. Project or Process Details: What was supposed to happen?
   - What were the objectives of the Project or Process?
2. What actually happened?
3. Why was there a difference?

Lesson Outcomes

1. Achievements: what was achieved?
2. Successes: What went well? Why?
   - How can we repeat the success?
3. Contributing Factors: What went poorly? Why?
4. Ideas for Process Improvement.
5. What shared resources (Templates, etc.) can be contributed to enable improved practices?
6. What other types of content does this lesson suggest? (Process Improvement, Success Story, Best Practice, Example of Innovation?)

Asset Labels

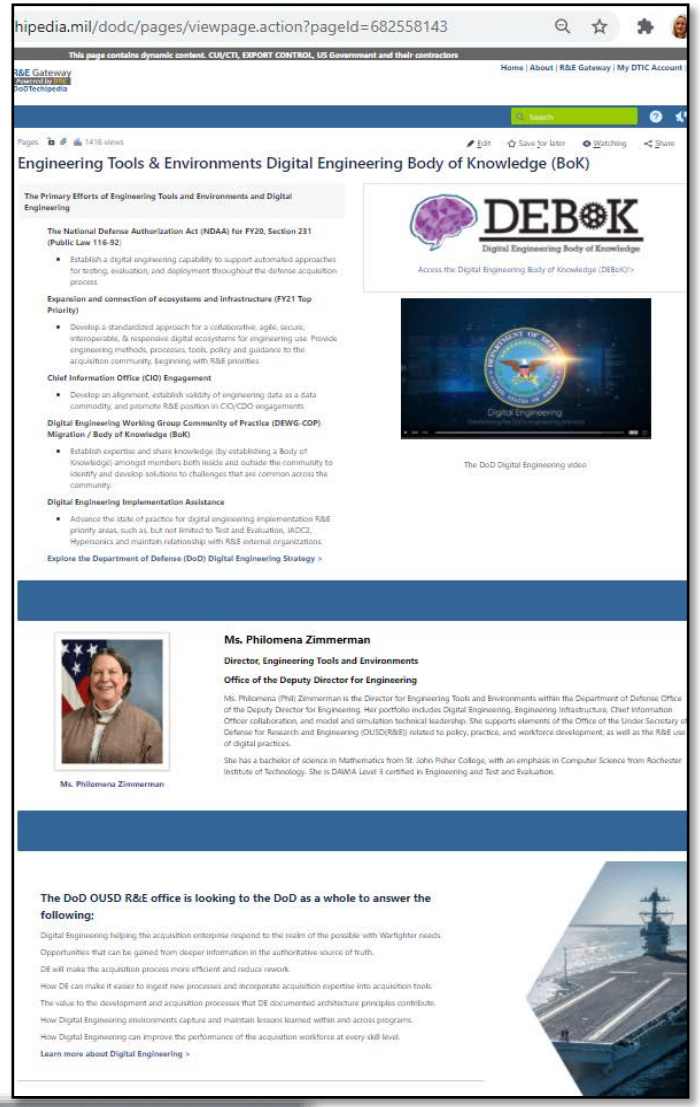
1. Description of the asset such as: *("This instruction reissues DoD instruction DoDI 1000.1 to establish policy, assign responsibilities, and provide procedures for DoD ID cards issued to meet certain requirements of the Geneva Conventions.")*
2. Keywords / Labels: to tag submission for improved search, such as: Geneva-Conventions, identification-cards.
3. Notes.

DEBoK Solution

The DEBoK is hosted on the **CAC-enabled** DTIC Platform managed by the Defense Technical Information Center (DTIC)'s Defense Communities

It is part of the DoDTechipedia, the Federal Government and contractor-wide Science & Technical Wiki, utilizing the Atlassian Confluence platform, to share information, upload files, and edit pages in real-time.

Framework: The DEBoK provides a structure to follow for establishing the Body of Knowledge. It provides Contextual Information and Knowledge Artifacts.



Features

- Straightforward display of **page trees** and **click paths**
- Freeform **content/formatting development**
- Good **permission control**
- **Embed artifacts / documents** Robust **search** by: Author, Keyword, Topic and Date
- Ability to **track usage: metrics and page statistics**
- **Blogging** capability

Interactivity

- Ability for users to **Like** preferred content
- **Most recently updated** content
- **Trending** or **most viewed** content
- Can offer **related content** on Knowledge base pages

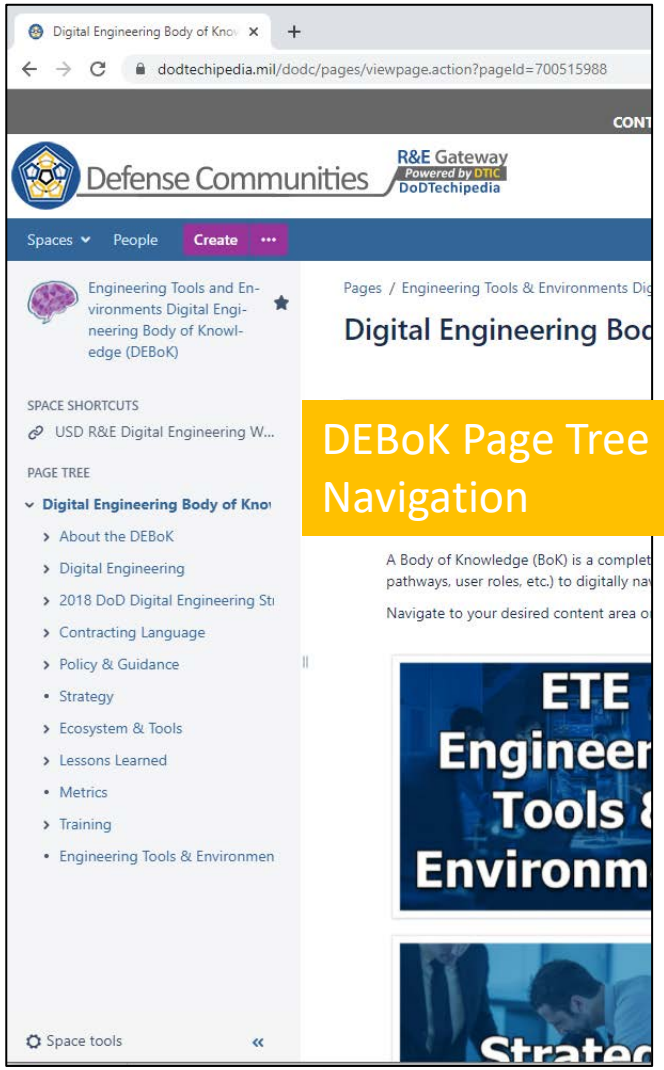
Profile Settings

- Users can **subscribe** for email **notifications** on page changes

Atlassian Confluence

DEBoK Components

- **Framework:** The DEBoK provides a structure to follow for establishing the Body of Knowledge
- **Contextual Information:**
  - About the DEBoK
  - Vision/Scope
  - Governance
  - Roles/Pathways
  - DE Info/Strategy
- **Knowledge Base Artifacts:**
  - Contracting Language
  - Policy & Guidance
  - Strategy
  - Ecosystem & Tools
  - Lessons Learned
  - Metrics
  - Training
  - Glossary



DEBoK Page Tree Navigation

Pilot Goals and Scope

Goals

- Determine if the DEBoK features meet stakeholder needs
- Determine if DEBoK content is helpful to assist practitioners with their job duties and Digital Engineering efforts
- Get feedback on layout, navigation, and style of the DEBoK

Scope

- Address user roles and pathways
- Evaluate features, assess templates, record observations, and assess the following capabilities

Capabilities are derived from the established DEBoK requirements

- Accessibility to Government, industry and academia
- Proper permission control and access
- Intuitive collaboration features
- Accurate and appropriate content and support of new content
- Assess search capability
- Viewable files, graphics, and videos
- DEBoK configuration/layout is intuitive
- Metadata/tagging collected is sufficient
- Reporting/metrics features function appropriately
- Governance approach is suitable

Modeling and Simulation BoK (ModSim BoK)

Objective

To ensure that the modeling and simulation community has the necessary resources to implement modeling and simulation; monitor the implementation process and have an appropriate knowledge base to successfully use modeling and simulation methods, processes and tools.

Sources of Information

- Current Modeling and Simulation BoK (knowledge, skills and abilities)
- Modeling and Simulation Catalog (links to resources)
- Glossary (terms and definitions)
- Modeling and Simulation Enterprise website
- Services, Combatant Commands, FFRDCs, UARCS (use cases, policy and guidance, contracting)
- Inter-service/Industry Training, Simulation and Education Conference workshops (user roles, requirements, structure)

A single location, ModSim community-supported, with information available to all

Deliverables:

- ✓ Terms of Reference (ToR)/Charter
- ✓ User Role Pathways/Structure
- Functions/Input Template(s) 2nd Qtr 22
- Governance 2nd Qtr 22
- Beta Release BoK 3rd Qtr 22

ModSim BoK POC:
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Points of Contact

DEBoK
Digital Engineering Body of Knowledge

https://www.dodtechipedia.mil/dodc/pages/viewpage.action?pageId=682558143

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