

Digital Engineering Competency Framework (DECF) v. 1.1

WRT-1006 (2019-2021)

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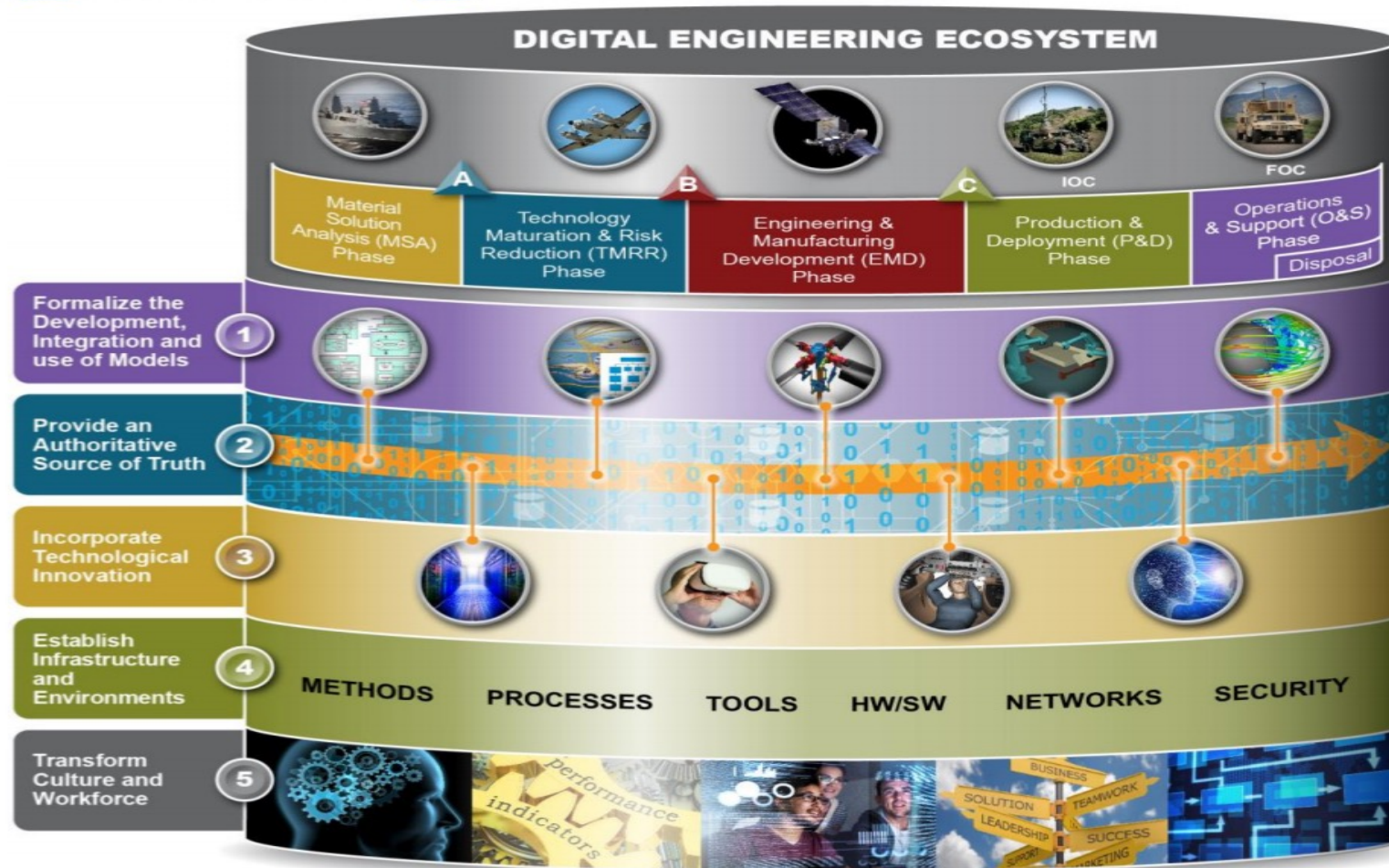
Digital Engineering Overview

■ What is Digital Engineering?

- Combines model-based techniques, digital practices, and computing infrastructure
- Enables delivery of high pay off solutions to the warfighter at the speed of relevance

■ Reforms Business Practices

- Digital enterprise connects people, processes, data, and capabilities
- Improves technical, contract, and business practices through an authoritative source of truth and digital artifacts

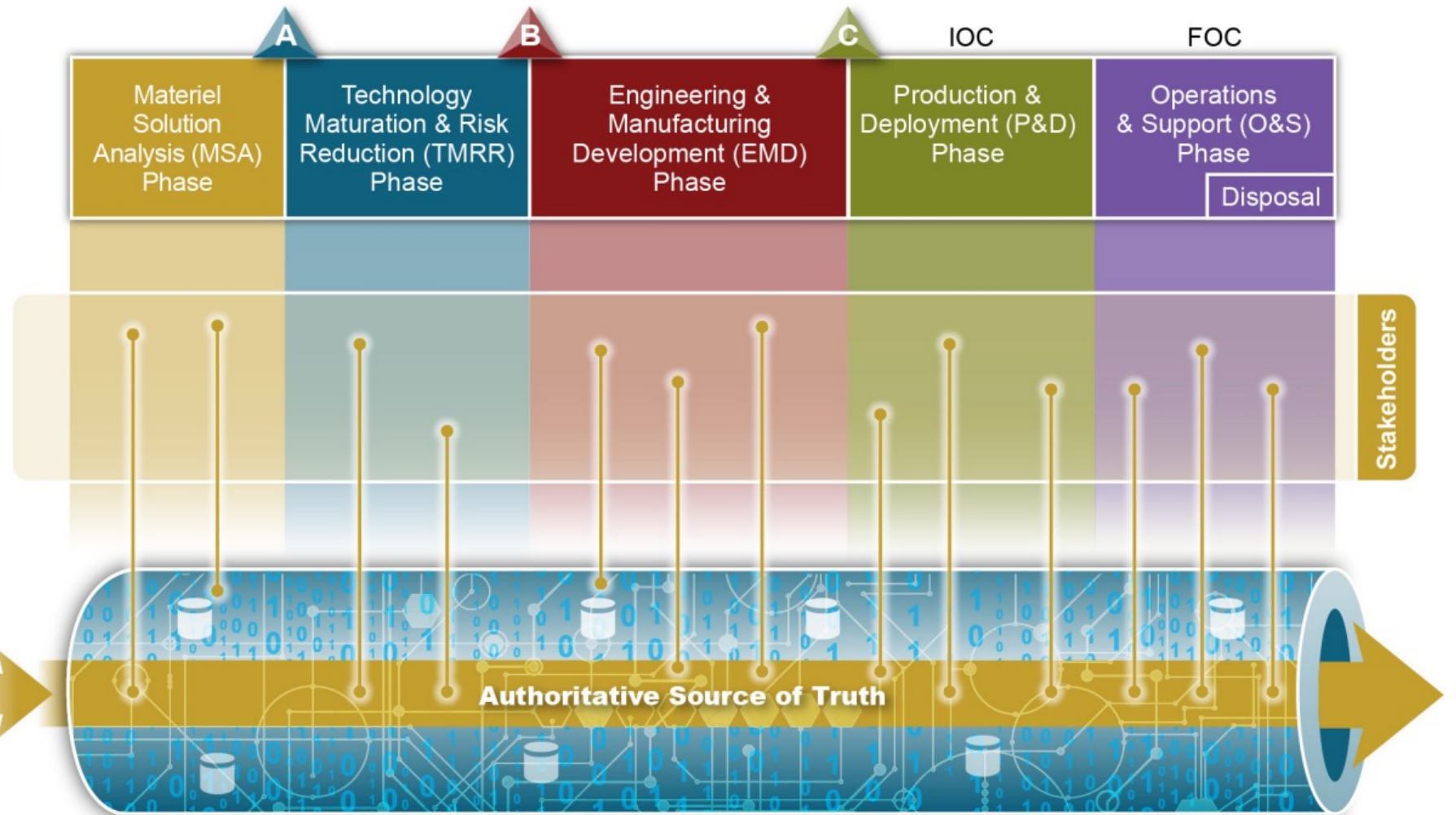


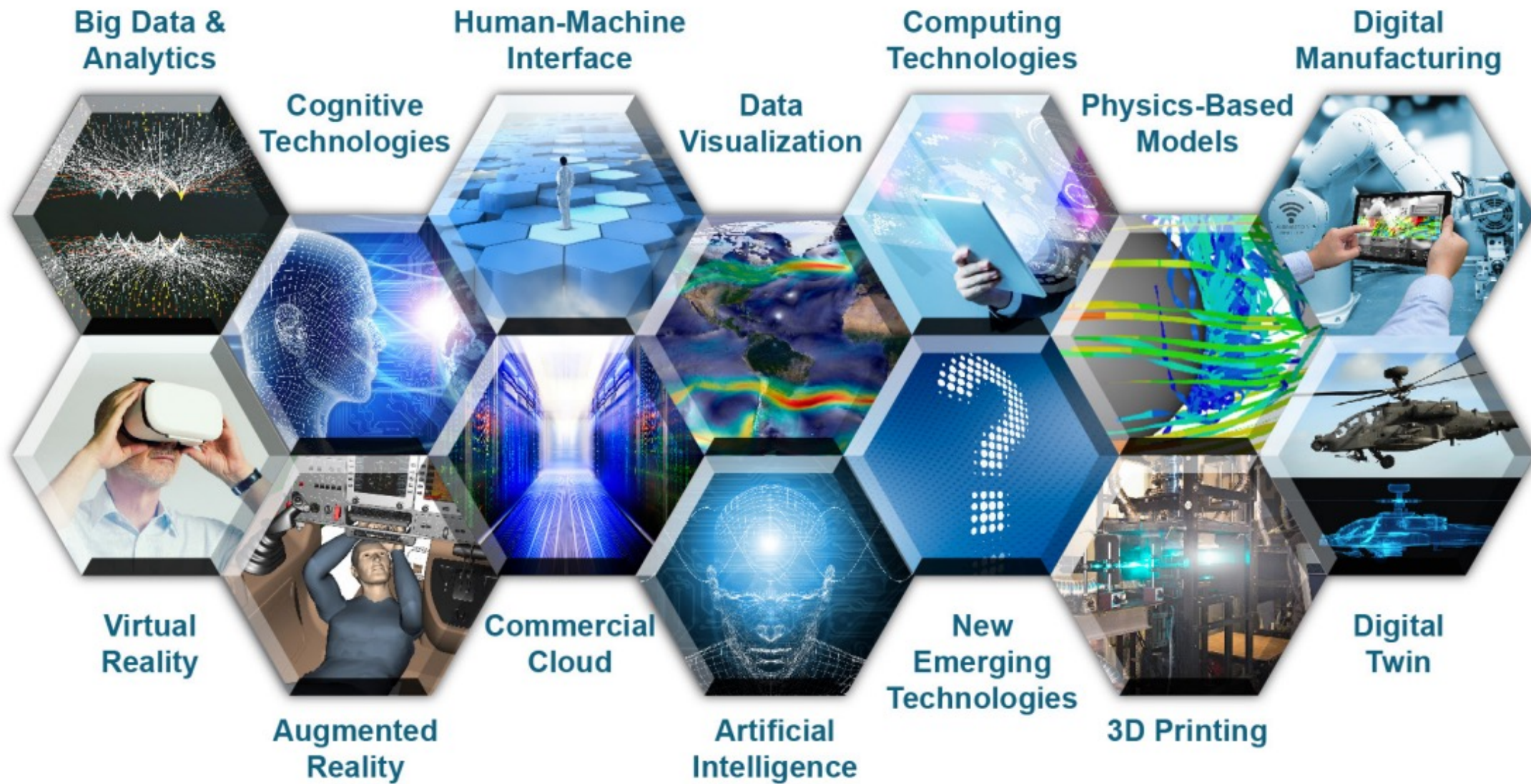
**Modernizes how we design, operate, and sustain capabilities
to outpace our adversaries**



Stakeholders

- Auditing
- Business – Cost Estimating
- Business – Financial Management
- Contracting
- Engineering
- Facilities Engineering
- Industrial Contract Property Management
- Information Technology
- Lifecycle Logistics
- Production, Quality & Manufacturing
- Program Management
- Purchasing
- Science & Technology Management
- Test & Evaluation



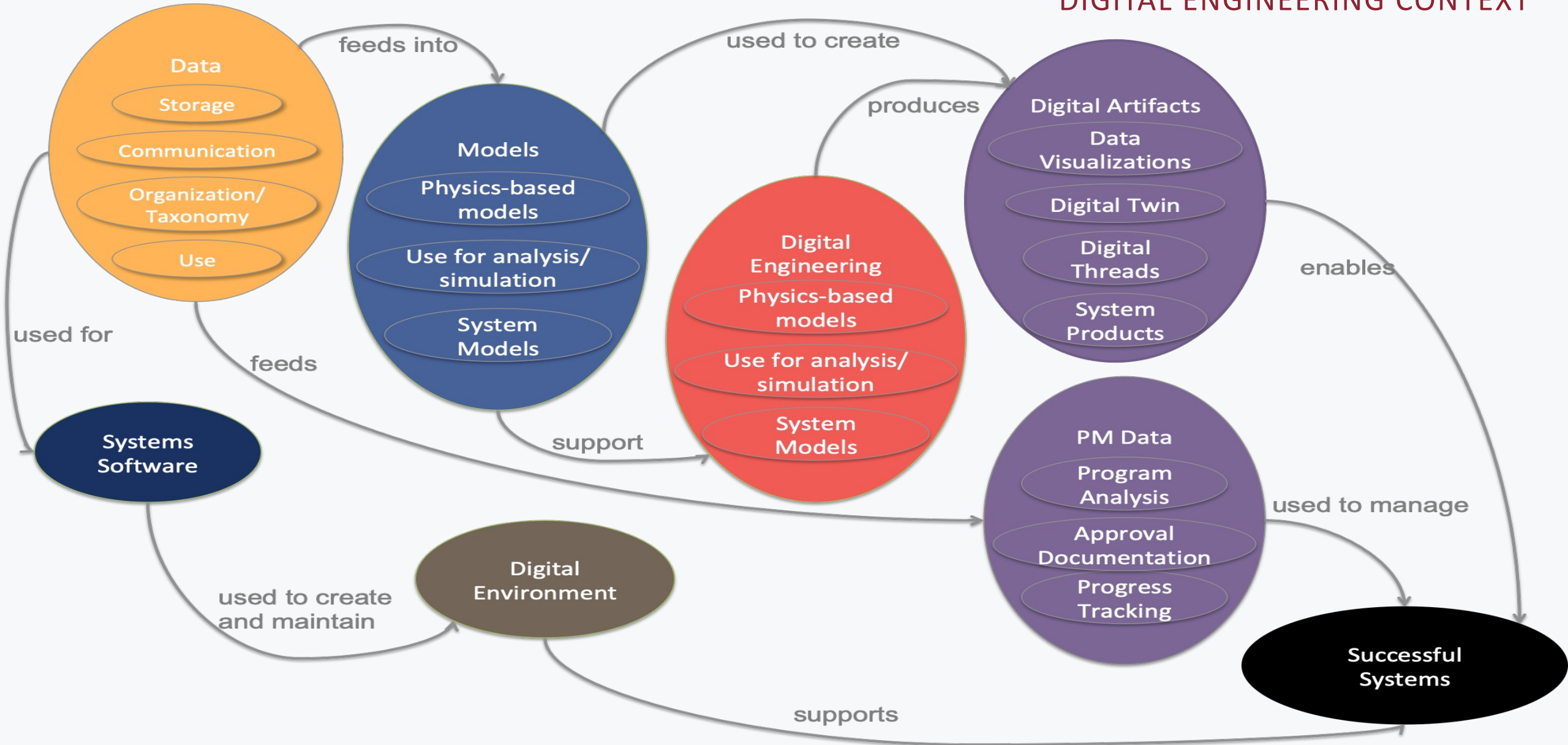




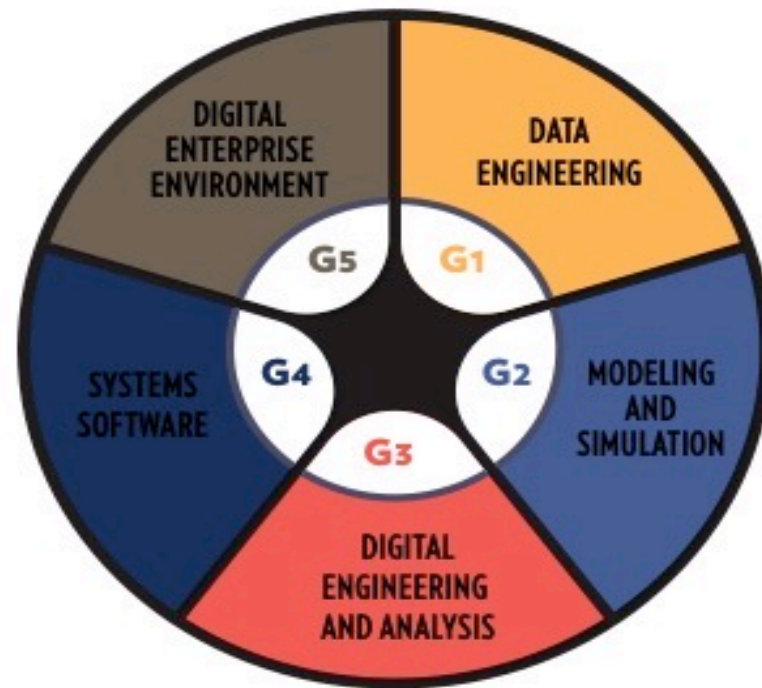


- Zoom out to Big Picture for context
- Identify focus areas at intersections
- Approached from multiple directions simultaneously
 - Investigated SE competency models for gaps and opportunities
 - Reviewed existing material for DE specific competencies and KSAB
 - Reviewed Competency Definitions for DE Enhancements
 - Reviewed tasks for DE enhancement
 - Reviewed proficiency levels for DE enhancement
- Validated competencies with
 - Practitioners/Trainers
 - SMEs
 - Sponsor

DIGITAL ENGINEERING CONTEXT



DIGITAL ENGINEERING COMPETENCY FRAMEWORK (DECF) VERSION 1.1



FOUNDATIONAL DIGITAL COMPETENCIES

F1	Digital Literacy
F2	Digital Engineering Value Proposition
F3	DoD Policy/Guidance
F4	Coaching and Mentoring
F5	Decision Making
F6	Software Literacy

LEGEND:

C# - Competency Title
 F# - Foundational Competency Title
 G# - Competency Group
 S# - Competency Subgroup

G1 DATA ENGINEERING

S1	Data Engineering	C1	Data Governance
		C2	Data Management

G2 MODELING AND SIMULATION

S2	Modeling and Simulation	C3	Modeling
		C4	Simulation
		C5	Artificial Intelligence/Machine Learning
		C6	Data Visualization
		C7	Data Analytics

G3 DIGITAL ENGINEERING AND ANALYSIS

S3	Digital Systems Engineering	C8	Digital Architecting
		C9	Digital Requirements Modeling
		C10	Digital Validation and Verification
		C11	Model-Based Systems Engineering Processes
S4	Engineering Management	C12	Digital Model-Based Reviews
		C13	Project and Program Management
		C14	Organizational Development
		C15	Digital Engineering Policy and Guidance
		C16	Configuration Management

G4 SYSTEMS SOFTWARE

S5	Systems Software	C17	Software Construction
		C18	Software Engineering

G5 DIGITAL ENTERPRISE ENVIRONMENT

S6	Digital Enterprise Environment Development	C19	Digital Environment Development
S7	Digital Enterprise Environment Management	C20	Management
		C21	Communications
		C22	Planning
S8	Digital Enterprise Environment Operations and Support	C23	Digital Environment Operations
		C24	Digital Environment Support
S9	Digital Enterprise Environment Security	C25	Digital Environment Security

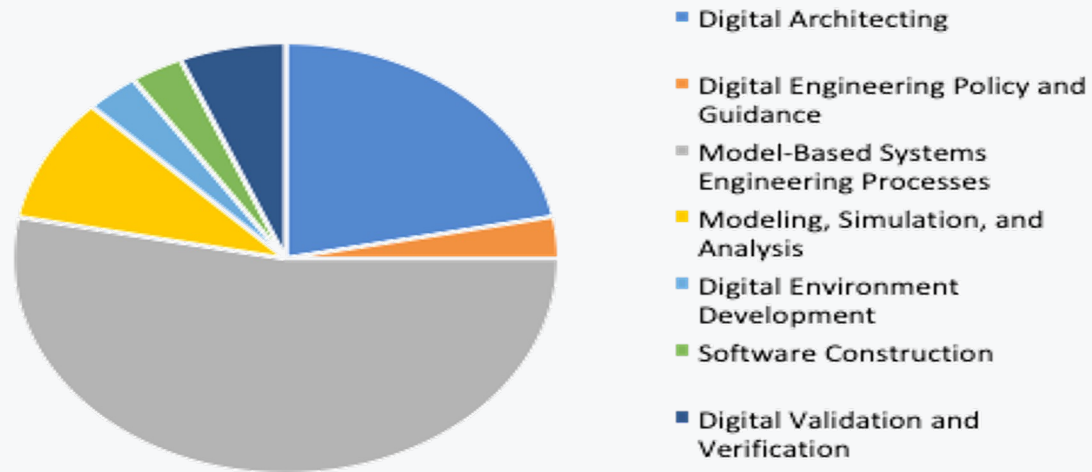
Proficiency Level Definitions

Proficiency Level	0	1	2	3	4	5
	None	Awareness	Basic General Knowledge (Entry)	Intermediate General Knowledge (Junior)	Advanced Detailed Knowledge (Senior)	Expert In-Depth Knowledge (SME)
Definition	No experience with or knowledge of the competency.	Applies the competency in the simplest situations.	Applies the competency in somewhat difficult situations.	Applies the competency in difficult situations.	Applies the competency in considerably difficult situations.	Applies the competency in exceptionally difficult situations.
		Requires close and extensive guidance.	Requires frequent guidance.	Requires occasional guidance.	Generally requires little or no guidance.	Serves as a key resource and advises others.
		Demonstrates awareness of concepts and processes.	Demonstrates familiarity with concepts and processes.	Demonstrates understanding of concepts and processes.	Demonstrates broad understanding of concepts and processes.	Demonstrates comprehensive, expert understanding of concepts and processes.

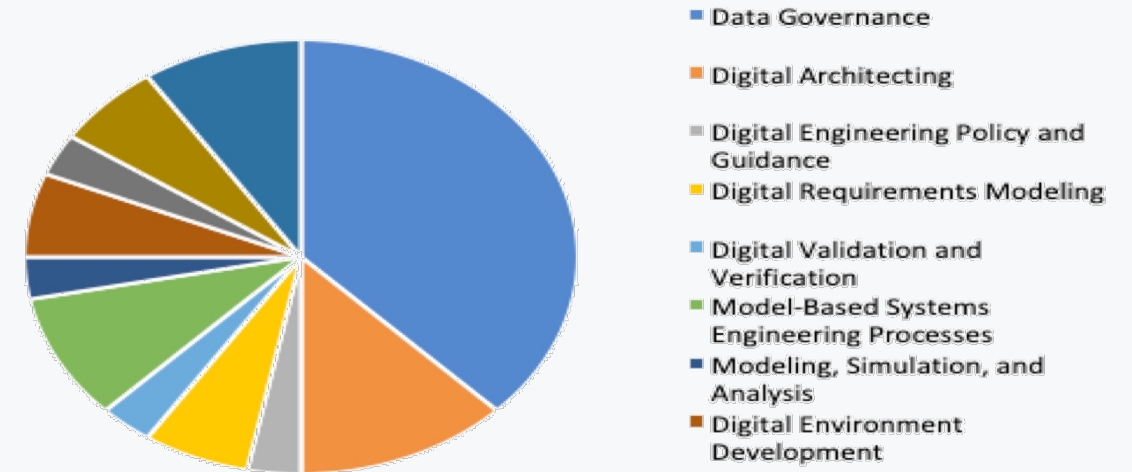
KSABs in DECF v. 1.1

Competency Group	Competency	Total KSABs	Proficiency Level				
			Awareness	Basic	Intermediate	Advanced	Expert
G1 Data Governance	C1 Data Governance	48	3	11	7	14	13
	C2 Data Management	30	2	7	1	14	6
G2 Modeling and Simulation	C4 Modeling	122	11	25	36	35	15
	C5 Simulation	56	8	8	16	16	8
	C6 Artificial Intelligence/Machine Learning	32	2	19	8	3	0
	C7 Data Visualization	22	2	4	12	2	2
	C3 Data Analytics	47	2	5	12	17	11
G3 Digital Engineering and Analysis	C8 Digital Architecting	55	3	14	18	18	2
	C9 Digital Requirements Modeling	24	1	3	15	4	1
	C10 Digital Validation and Verification	13	2	2	6	3	0
	C11 Model-Based Systems Engineering	108	11	33	17	35	12
	C12 Digital Model-Based Reviews	15	2	1	6	5	1
	C13 Project and Program Management	42	2	18	12	7	3
	C14 Organizational Development	18	1	2	1	4	10
	C15 Digital Engineering Policy and Guidance	23	1	3	2	7	10
	C16 Configuration Management	19	1	3	5	8	2
G4 Systems Software	C17 Software Construction	18	1	8	3	5	1
	C18 Software Engineering	47	3	5	5	24	10
G5 Digital Enterprise Environment	C19 Digital Environment Development	47	1	15	3	15	13
	C20 Management	28	2	2	1	10	13
	C21 Communications	12	1	2	1	3	5
	C22 Planning	11	1	2	2	3	3
	C23 Digital Environment Operations	27	3	4	8	10	2
	C24 Digital Environment Security	42	6	2	7	16	11
	C25 Digital Environment Support	56	2	5	12	22	15
		962	74	203	216	300	169

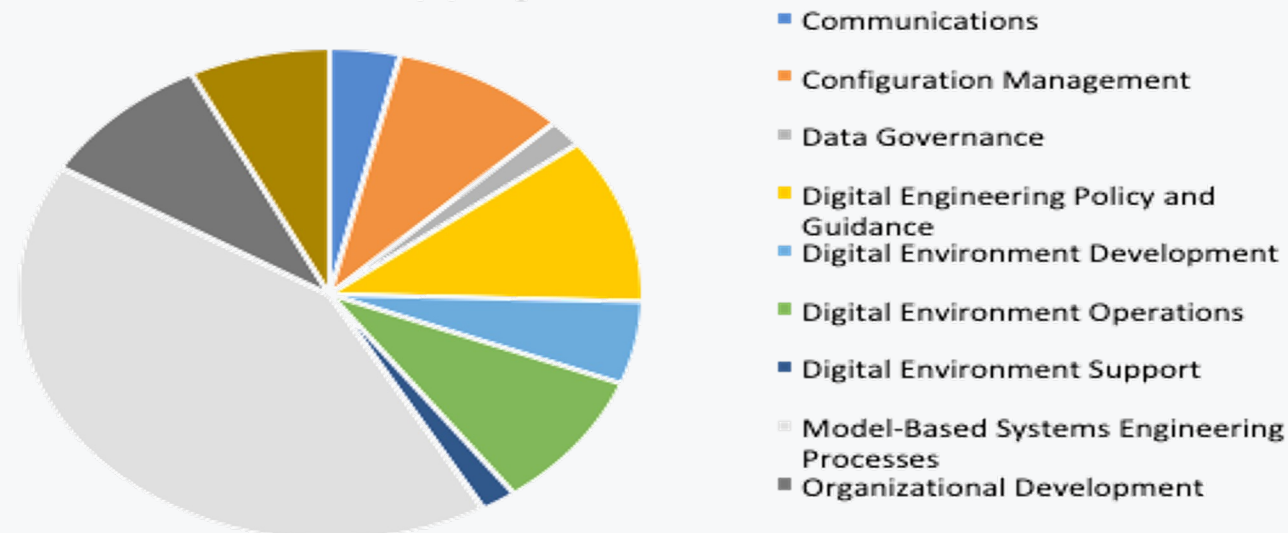
(a) Digital Twin



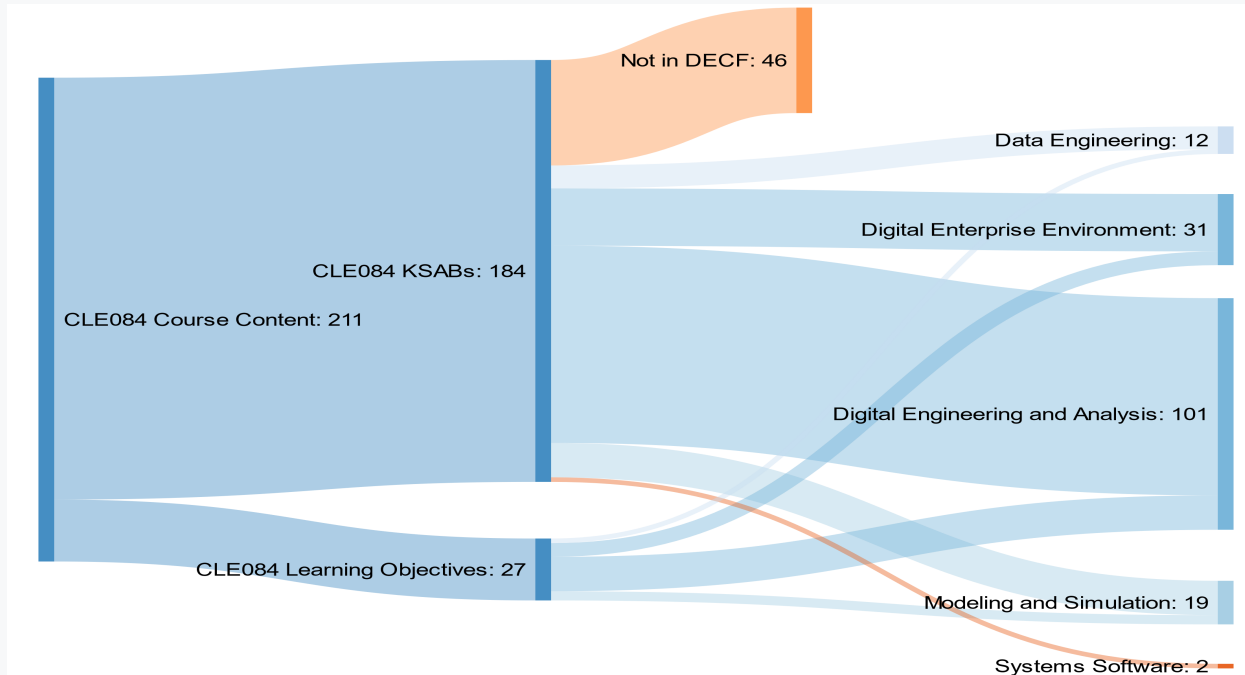
(b) Digital Thread



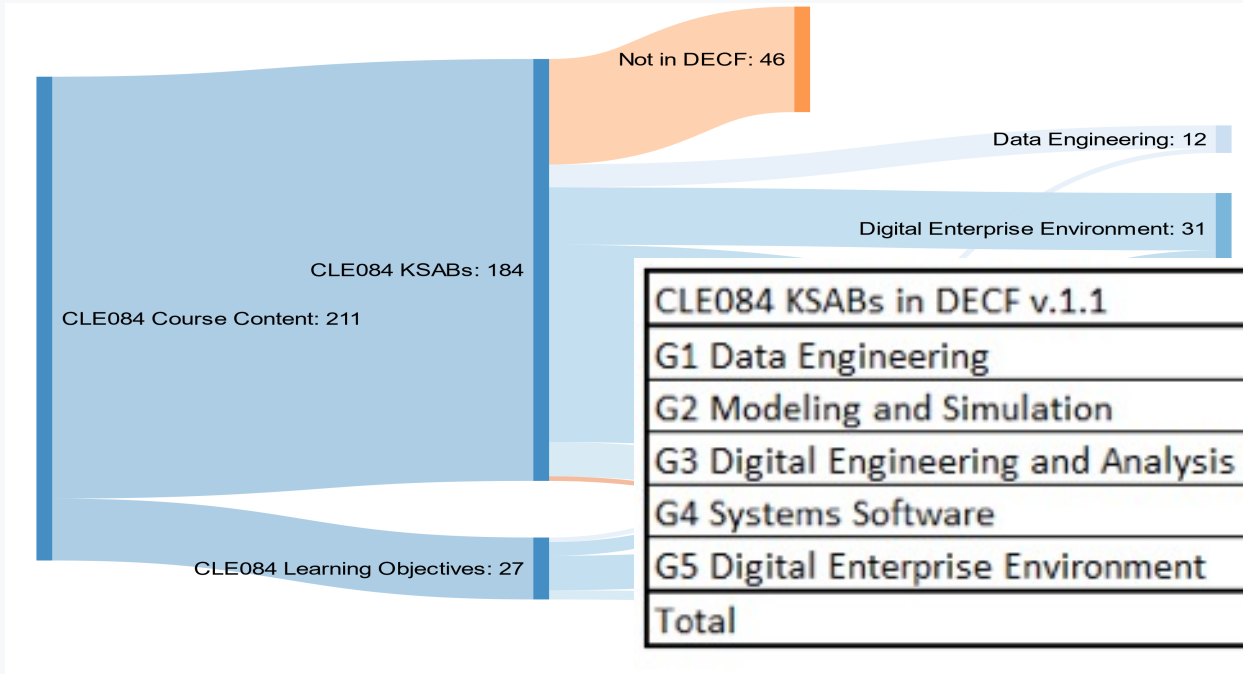
(c) Digital Artifacts



- CLE 084
- Coursera MBSE



- CLE 084
- Coursera MBSE



CLE084 KSABs in DECF v.1.1	Awareness	Basic	Intermediate	Advanced	Expert	Total
G1 Data Engineering	4	3	3	0	0	10
G2 Modeling and Simulation	1	9	5	0	0	86
G3 Digital Engineering and Analysis	18	42	22	4	0	25
G4 Systems Software	0	2	0	0	0	15
G5 Digital Enterprise Environment	7	15	3	0	0	2
Total	30	71	33	4	0	138

Coursera KSABs in DECF v.1.1	Awareness	Basic	Intermediate	Advanced	Expert	Total
G1 Data Engineering	3	1	0	0	0	4
G2 Modeling and Simulation	3	1	0	0	0	4
G3 Digital Engineering and Analysis	7	1	0	0	0	8
G4 Systems Software	0	0	0	0	0	0
G5 Digital Enterprise Environment	0	0	0	0	0	0
Foundational Digital Competencies	1	3	0	0	0	4
Total	14	6	0	0	0	20

Total not in DECF	46
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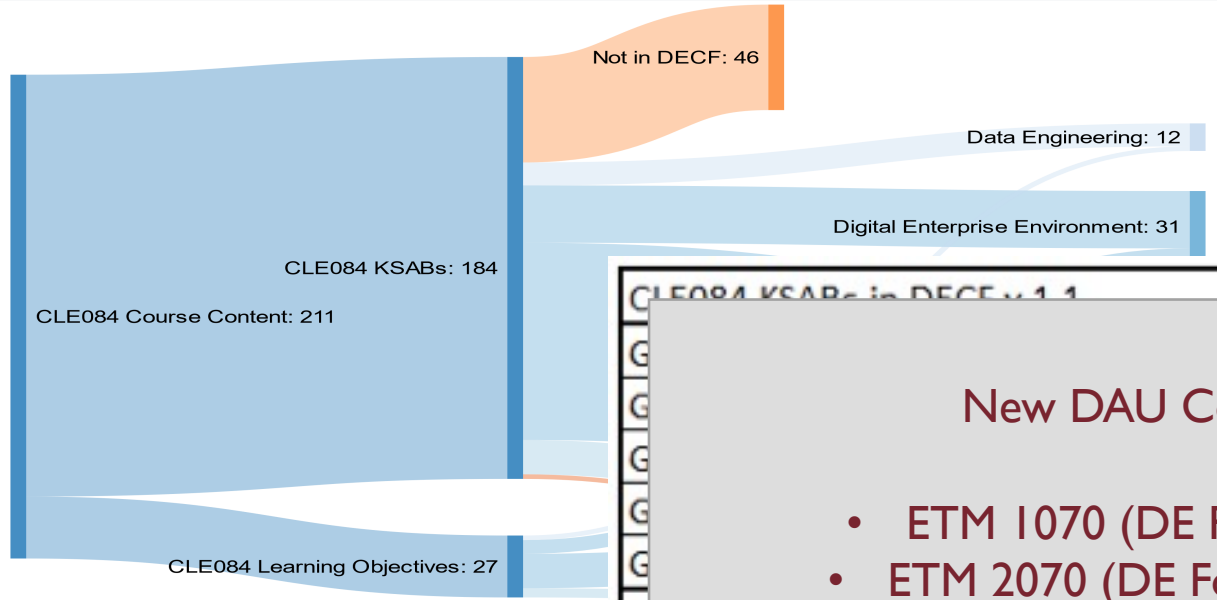
Total not in DECF	12
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- CLE 084
- Coursera MBSE

New DAU Courses

- ETM 1070 (DE Foundations)
- ETM 2070 (DE Foundations 2)
- DE Credential (in development)

Want to learn more? Attend the VRT-1043 presentation.



CLE084 KSABs in DECF v.1.1		Awareness	Basic	Intermediate	Advanced	Expert	Total
G1	Data Engineering	3	0	0	0	0	10
G2	Modeling and Simulation	5	0	0	0	0	86
G3	Digital Engineering and Ana	22	4	0	0	0	25
G4	Systems Software	0	0	0	0	0	15
G5	Digital Enterprise Environment	3	0	0	0	0	2
T	Total	33	4	0	0	0	138

Coursera KSABs in DECF v.1.1							total
G1	Data Engineering						4
G2	Modeling and Simulation						4
G3	Digital Engineering and Ana						8
G4	Systems Software						0
G5	Digital Enterprise Environment	0	0	0	0	0	0
	Foundational Digital Competencies	1	3	0	0	0	4
	Total	14	6	0	0	0	20

Total not in DECF	46
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Total not in DECF	12
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THANK YOU

| Stay connected with us online.



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