



Air Force Institute of Technology School of Systems & Logistics

Digital Materiel Management Academy



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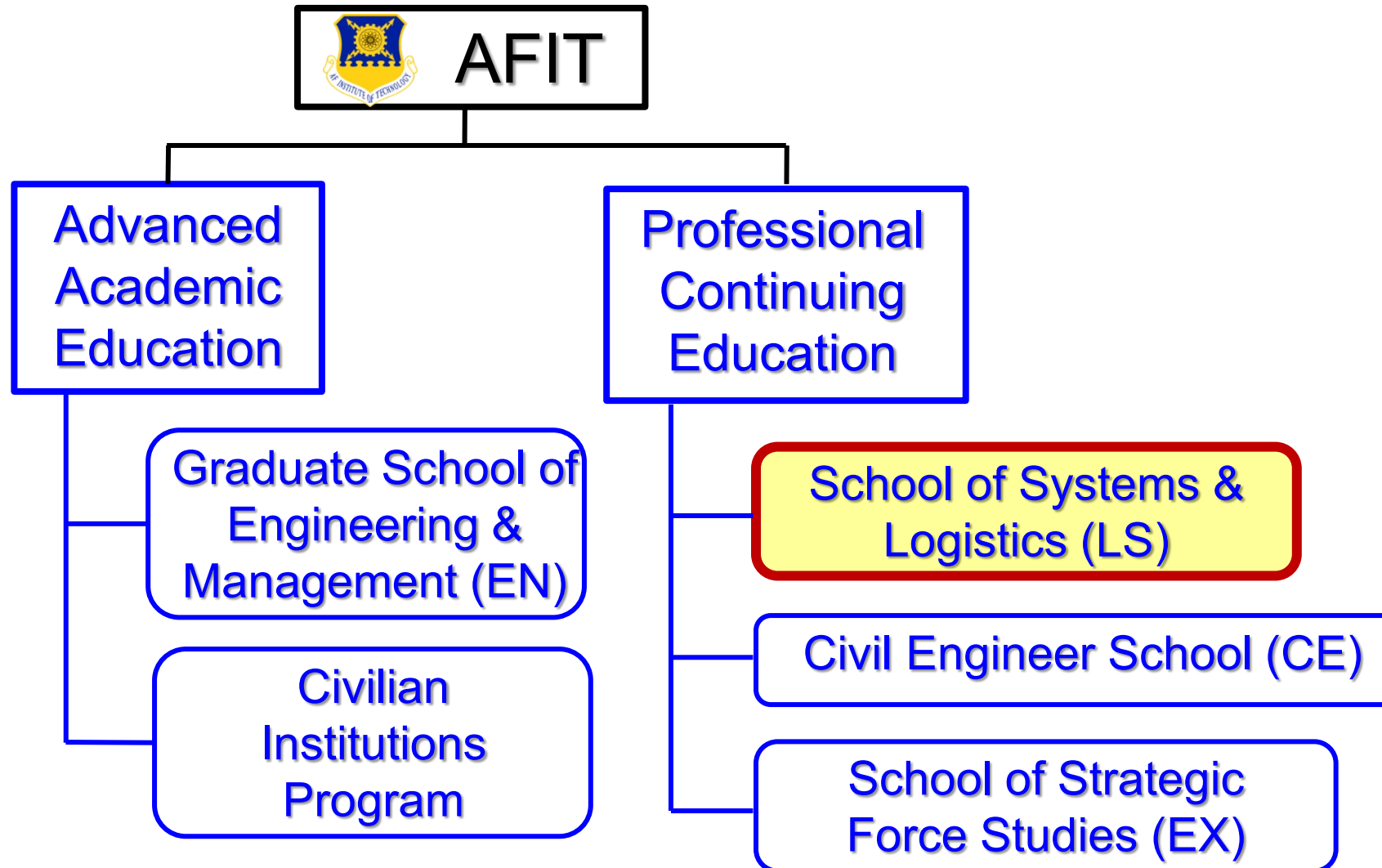




IAW JER para. 3-209: The views expressed are those of the authors and do not reflect the official guidance or position of the United States Government, the Department of Defense the United States Air Force or the United States Space Force



AFIT's Organization



AFIT Education Excellence:

Inspiration → Imagination → Innovation → Invention → Implementation → Impact



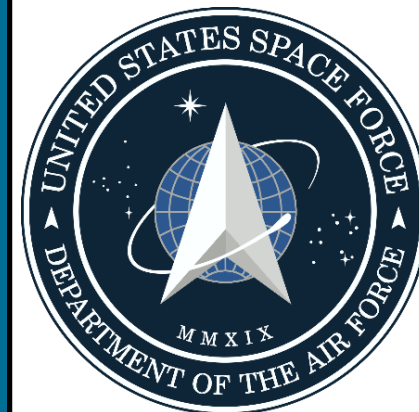
LSS Overview



Technical Competency-Based Education & Consulting

Numerous sponsors & customers, including:

- Air Staff – SAF/AQR, AF/A2/6, AF/TE, NASIC
- MAJCOMs – AFMC, ACC, AMC, AFGSC, AFSOC
- Centers & SPOs – AFRL, AFLCMC, 711 HPW, CROWS, F-35
- U.S. Space Force – SpOC, SSC



AFIT Education Excellence:

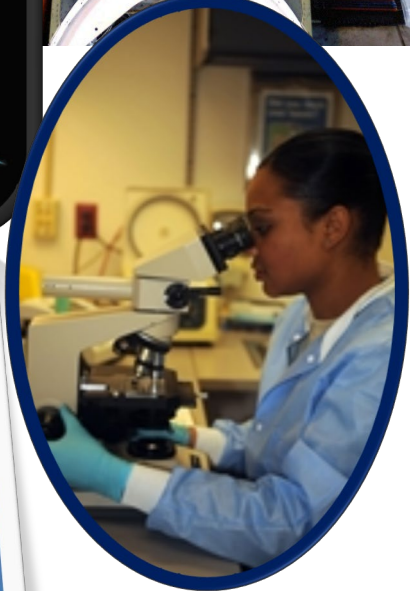
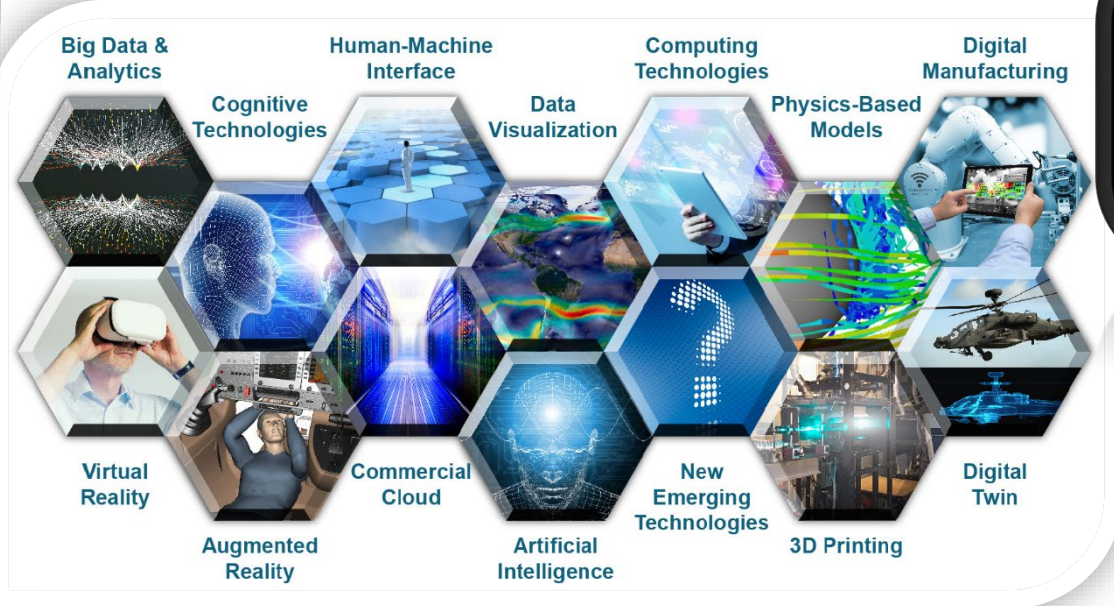
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Numerous & Diverse Topics



- Systems & Digital Engr, MBSE
- Test & Evaluation
- Reliability and Reliability Growth
- Science of Test, Design of Exprmt
- Software Development & Mgmt
- Architectures
- Intelligence Analysis & Acquisit'n
- Risk Management
- Manufacturing Assessment
- Human Systems Integration
- Airworthiness Certification
- Cybersecurity



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Unclassified



Digital Acceleration and Transformation





Right Sized Education

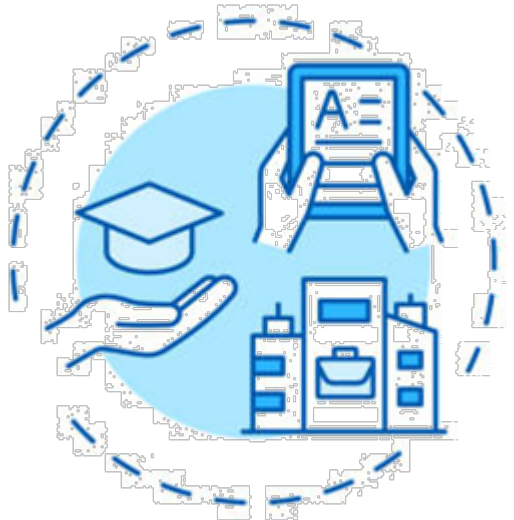


Professional Continuing Education



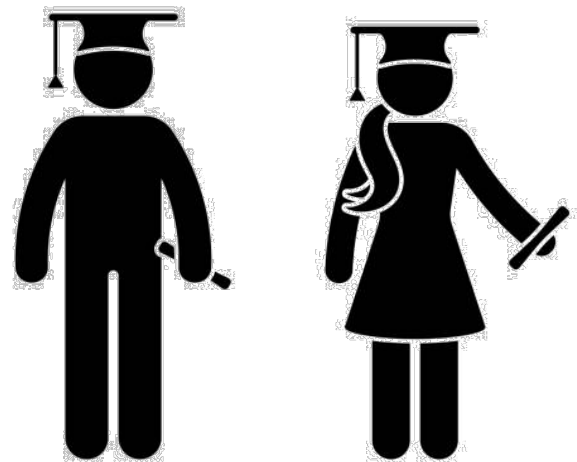
- Multi-tier short course ranging from 1 hour to 6 months
- Variety of disciplines

Digital Materiel Management Academy



- Applied learning based on program's stage of acquisition and model
- Industry, academia, and government focused on program workforce development to achieve ATO within the program

Graduate Education & Research



- Traditional degree seeking education – MS, PhD levels
- Deep dive on a topic area



Digital Materiel Management Academy



- Create a Digital Literate Force
- Integrates Education, Tools, Exercises
- Produce Program Digital Artifacts

WDMMA 001 Research and Early System Development

Pre Milestone A through
~Systems
Requirements Review
(SRR)

WDMMA 002 System Acquisition

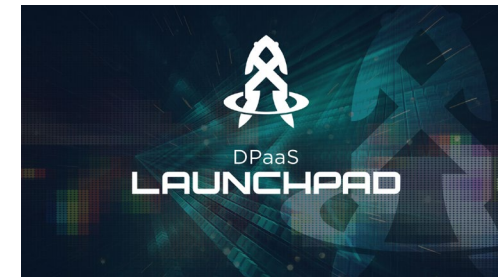
~SRR through
~Critical Design
Review / Fielding

WDMMA 003 System Sustainment

Fielding through
Service Life

Executed by the School of
Systems & Logistics in
conjunction with DIICE

Example teaching tools and products:



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How the DMMA Works

- All IPT Functions Invited
- Asynchronous Education
- Synchronous Exercises

Instructors will help you build your Gov't Reference Model for your system that your program can use after participating



Source: <https://www.familyhandyman.com>



Sample DMMA Exercise

- **Building a Requirements Management Powerhouse: Integrating Stakeholder Inputs, Change Management, and System Requirements**
- Using concepts learned in Lessons 3 and 4, create a comprehensive model that showcases a robust requirements management process.
 - Develop change management workflows
 - Elicit and model stakeholder inputs using MBSE tools
 - Evaluate and resolve conflicting requirements to ensure system integrity
 - Generate system requirements that meet stakeholder needs
 - Document and execute all activities and workflows to ensure transparency and repeatability
- By the end of this model build, you will have a functional model that demonstrates your mastery of requirements management, change management, and stakeholder input integration. You will be able to showcase your model as a best practice example of how to effectively manage requirements and drive system development success.



DMMA 001 Alpha Class



- **Organization: AFLCMC/WII Medium Altitude UAS**
- **Student Body: 22 Participants**
 - **2 Program Managers**
 - **3 Logisticians**
 - **17 Engineers**
- **Dates: 3 June – 12 July 2024**
- **Time: 136 hours of anticipated content**
 - **28 hours self-study material review (slides and demo videos)**
 - **108 hours working as an IPT live in a virtual classroom**



Source: militarymachine.com

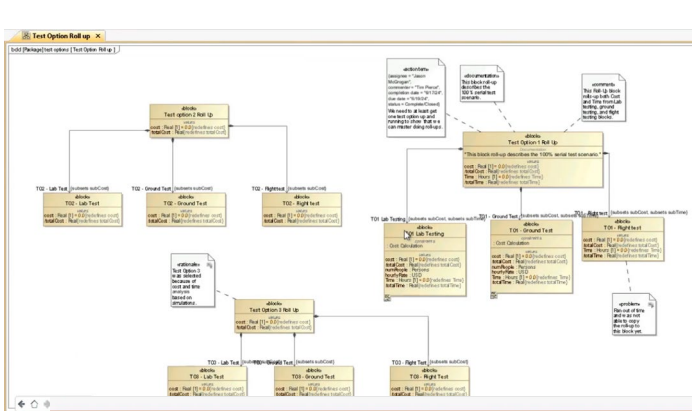
Timeframe and hours may vary pending size of project



DMMA 001 Alpha Class



- Cohort divided into 2 Team Projects
 - Project 1: Configuration, Integration, and Interface Requirements
 - Project 2: System Performance Requirement Traceability and Verification



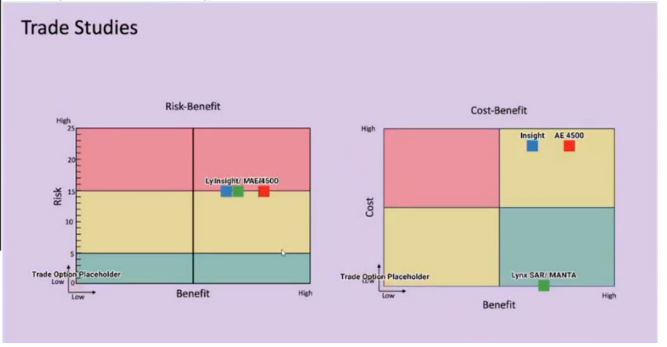
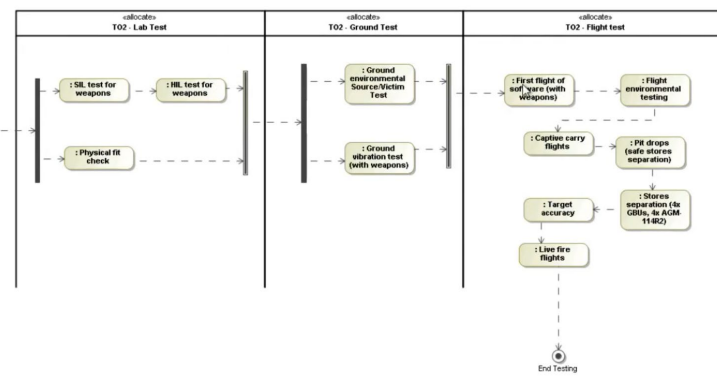
#	Name	Text	Satisfied By	Documentation
1	1 Entrance Criteria 1	The acceptability criteria defined below for each of the ASR technical review products have been established and/or tailored for the specific program.		As long as the children are satisfied, then the parent requirement is satisfied.
2	15.1 Entrance Criteria 1	Requirements Consolidation: <u>Model</u> the consolidation of refined requirements, including the updated context, CONOPS, related solutions, and thresholds/objectives.	Acquisition Domain	
3	15.2 Entrance Criteria 1.2	System Architecture Overview: Develop a high-level description of the preferred material solution(s), including interfaces, external dependencies, and functional and performance requirements.	Test Option 3 Roll Up	
4	15.3 Entrance Criteria 1.3	Requirements Documentation: <u>Model</u> system requirements statements with well-formed requirements characteristics, enabling a clear understanding consistent with the project objectives.	Requirements	
5	15.4 Entrance Criteria 1.4	Preferred Material Solution Documentation (Part 1): Document the completed AoA with acceptable coverage of alternative solutions and adequate detail of analysis for the preferred material solution(s).	Test Option Roll up	
6	15.5 Entrance Criteria 1.5	Preferred Material Solution Documentation (Part 2): Create a comprehensive rationale for the preferred material solution(s), including scoring results, draft CONOPS, assumptions, constraints, and trade study results.	Test Cost and Time Roll-Up In	
7	15.6 Entrance Criteria 1.6	Program Risk Assessment: Perform a preliminary cost, schedule, and technical risk assessment for the preferred solution(s) and develop mitigation plans.	Canada MQ-9B Risk Export	
8	2 Entrance Criteria 2	All preparatory actions listed below for the specific program have been successfully accomplished within the <u>model</u> to support conducting the technical review.		As long as the children are satisfied, then the parent requirement is satisfied.
9	22.1 Entrance Criteria 2.1	Develop a way to capture and tailor ASR Entry/Exit Criteria in the <u>model</u> , ensuring a clear understanding of requirements.	ASR	
10	22.2 Entrance Criteria 2.2	Show how to satisfy criteria with <u>model</u> elements and other artifacts, ensuring a comprehensive review.	ASR	
11	22.3 Entrance Criteria 2.3	Develop a way to track and update Action Items using <u>model</u> properties, streamlining the review process.	Action Item Table	
12	22.4 Entrance Criteria 2.4	Create a comprehensive ASR presentation, organizing all relevant elements for efficient review.	Alternative System Review Pre	
13	2 Entrance Criteria 3	The acquirer and supplier concur that the preferred material solution and technical plans support the case for the ASR as judged against the tailored product acceptance criteria.	Test Option Roll up	

Alternate Systems Review Status (In Progress)

Entrance Criteria 1	Exit Criteria 1
Entrance Criteria 2	Exit Criteria 2
Entrance Criteria 3	Exit Criteria 3
Entrance Criteria 4	Exit Criteria 4
ASR Artifact Template	Exit Criteria 5
	Exit Criteria 6

ASR Acceptability Criteria (Satisfied)

Risk Owner	Status	Initial Risk Level	Mitigation	Mitigation Cost	Days to Mitigate	Residual Probability
Team Canada	Open	Medium	Having a secondary range for testing	1000000	100	0.2
Team Canada	Open	Low	Order S&I early on program	1000000	540	0.2
Team Canada	Open	Medium	Order S&I early on program	50000	720	0.1
Chief Engineer	Open	Low	Follow the Airworthiness standard timeline	0	30	0.1
Team Canada	Open	Medium	Look at the weather forecast	0	0	0.2
Team Canada DET-3 Canada RPAS Group Eglin - GBU-54 SPO TAGM - Hillfire (AGM-114R2) SPO	Open	Low				
DET-3	Open	Medium	Coordinate with S&I scheduler as soon as possible	0	100	0.2
DET-3	Open	Medium	Coordinate with HIL scheduler as soon as possible	0	100	0.2
DET-3	Open	Medium	Hire more people.	500000	100	0.1
Team Canada GA-ASI Canada Team Test Range Crew	Open	Low				
TAGM - Hillfire (AGM-114R2) SPO Eglin - GBU-54 SPO	Open	Medium	Work with weapons SPO to coordinate weapons needed data.	0	720	0.1





- **Benefits Seen**

- DMM can boost system insight and understanding with a digital advantage
- DMM can provide valued input into multiple functions.
- DMM can be learned and applied in a matter of weeks.

- **Student Feedback**

- Having a chance to execute the actions to create a model was very helpful
- Lots of training available for language and tool tips and tricks, but taking the acquisition process and robustly applying complex SysML and Cameo processes was new and effective.
- Watching someone go through a canned presentation is one thing, but then rolling up your sleeves and doing it on your project where it might not be so neat and fit perfectly, that is where the real learning and problem solving comes.



Digital Materiel Management Education



"Digital" context now in many existing courses and workshops

- WKSP 0732: Current Topics in Digital Acquisition & Digital Materiel Management*
 - SYS 282: Management of the Systems Engineering Process (24 hrs)
 - WKMBSE 101 – DMM in a Model-Based Environment (2 hrs)
 - WKMBSE 201 – Introduction to MBSE and SysML (8 hrs)
 - WKMBSE 301 – Applied MBSE using SysML (12 hrs)
 - WKMBSE 401 – SysML Model Analysis and Evaluation (12 hrs)
 - Avolve Learning Paths*
- In-work:
- Multi-functional DMM application workshops
 - MBSE micro-credential



* - Free to eligible defense industry contractors

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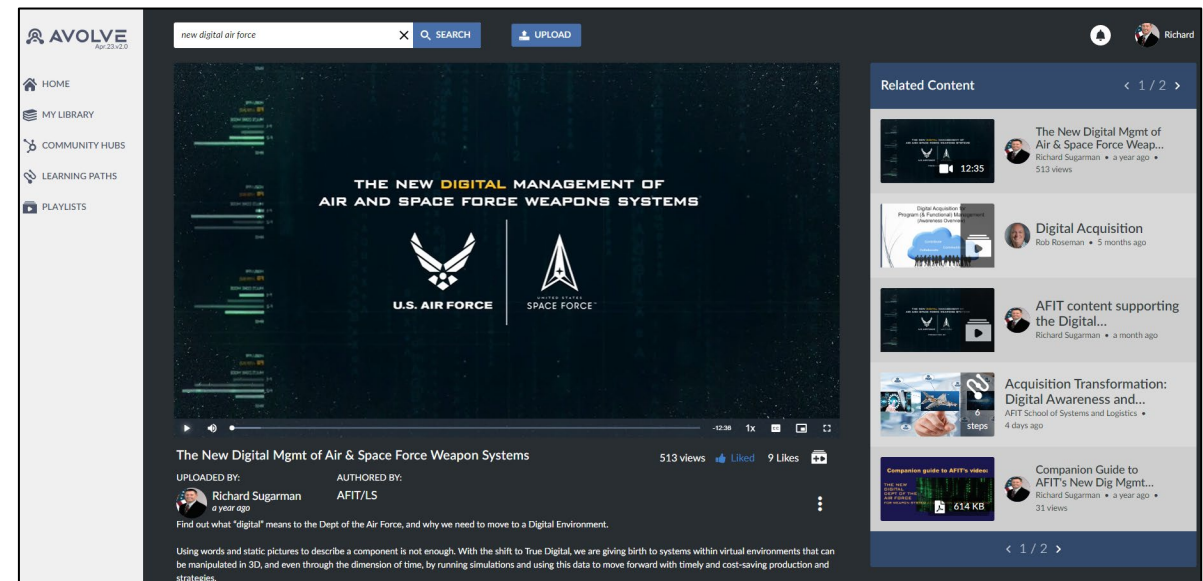
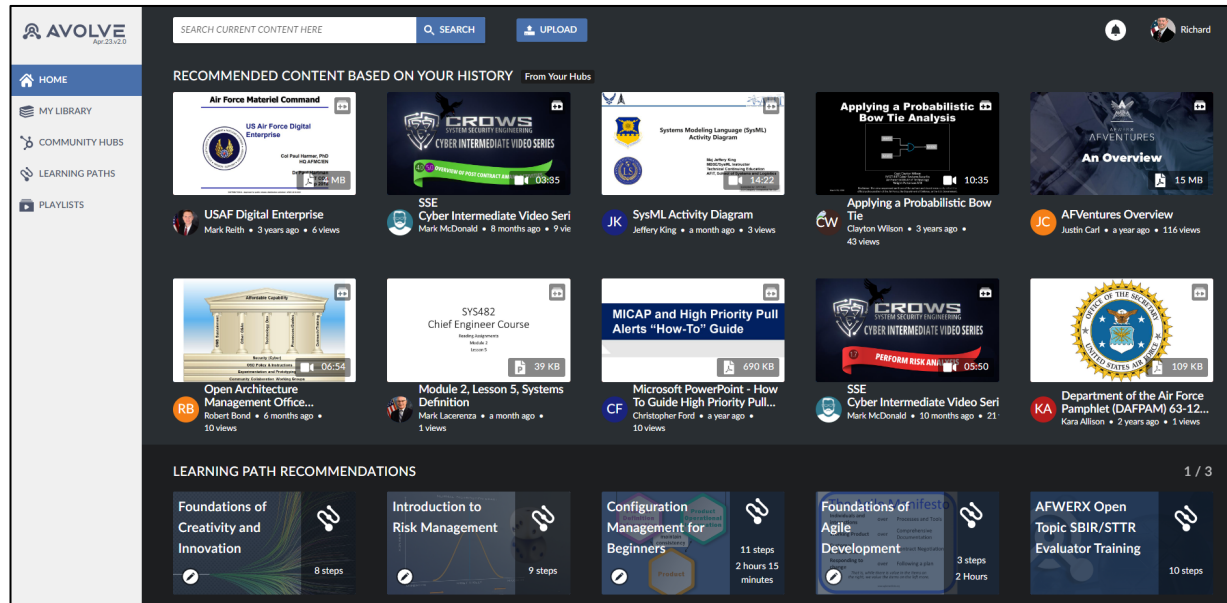
www.afit.edu/LS/avolve.cfm



- Content sharing application with Netflix/YouTube-type of look & feel
- Crowd-sourcing of content, increased accessibility to DoD-focused content

- Content organized into domain “hubs” & “tag” searchable
- Knowledge-centric vs. Organization-centric
- CAC authenticated – IL-4 certified

Unclassified





Questions?



Interested in attending
contact Maj Jeff King
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<http://www.afit.edu/ls>

