Unified Architecture Framework (UAF) Summit – Wednesday, March 23, 2022

Note: All times are listed in Eastern Time (EDT)

9:00 – 9:30 am | **Welcome Address**

Co-Chair: Aurelijus Morkevicius, Consultant Senior Manager (Dassault Systèmes)

Co-Chair: Laura Hart, Research Engineer Senior Manager (Lockheed Martin)

Abstract: An introduction to the event and the UAF's purpose, adoption and v1.2 roadmap.

9:30 – 10:10 am | **KEYNOTE: Making Architecture Real: Empowering Enterprise Adoption Through Workforce Development**

Erin Bootle, System Engineering Manager (NIWC Atlantic)

Abstract: This presentation will focus on the lessons learned as a large organization shifts its culture to adopt and embrace enterprise architecture as an integral part of systems engineering. To take full advantage of architecture, it is not enough to have a few highly-skilled individuals with tool access to create architectural products: an organization must be permeated with an understanding of architecture across the workforce for the true value to be realized. Everywhere within the organization there needs to be people with varying levels of architectural skills. For architecture to be truly adopted, your organization needs champions, highly-advanced architects, and those who provide inputs. Architecture is not just for architects. It is for all areas of an organization and workforce development is pivotal in adopting it.

Bio: Erin is the Supervisor for the Architecture, Requirements, and Modeling for C4I and Enterprise Systems as well as the MBSE Training Lead at Naval Information Warfare Center, Atlantic where she has worked for more than 10 years. She has performed multiple Systems Engineering, Architecture, and Requirements roles at the command. She also retired after 21 years in uniform in the Navy, combined Active Duty and Reserve, as a Human Resources Officer. Erin holds degrees in Mechanical Engineering, a Master's in Aeronautical Science with a specialty in Space Studies, and an MBA. She is a Certified System's Engineering Professional (CSEP), OCSMP Modeling Professional, and a Professional in Human Resources (PHR).

10:10 – 10:30 am | **Morning Break**

10:30–11:00 am | **Army Ground Vehicle Research Center (GVSC): The Use of UAF to Define Vehicle Architectures**

Shannon Griffith (Systems Engineer, DoD US Army Ground Vehicles Robotics, Architecture Group)

David Hetherington, Principal (Systems Strategy, Inc.)

Abstract: AGVRA is the Reference Architecture for Autonomous Ground Vehicles that will provide architectural guidelines and best practices, business and technical, for the Army Robotics and Autonomous Systems (RAS) community.

AGVRA 3.0 consists of a suite of nine interoperable domain specific reference architectures that cover the design problem all the way from the organizational capabilities down to low-level details of the brake actuators in a combat vehicle.

In addition to giving an overview of AGVRA itself, this presentation will cover the top two layers of the AGVRA suite: Large Unit Mission (LUM) based on UAF and Small Team Task Model (STM) based on SysML.

Since both LUM and STM models need to be rigorously traced to Army doctrine and other standards, we have also developed a profile of elements based on the Dublin Core metadata standard in use by major libraries worldwide to systematically categories information publications of all sorts. We refer to this piece as the REF profile and it will be presented.

Finally, we will conclude with a brief discussion of some of the practical tooling challenges we encountered in doing this work as well as some related fundamental digital engineering challenges that could benefit from the attention of the OMG community.

Bio: Shannon has twenty years of experience in Systems Engineering in both automotive and defense domains. His experience includes numerous electromechanical devices and shift by wire actuators from multiple perspectives including safety, quality and electrical engineering. Shannon has a B.S.E. in Electrical Engineering from Kettering University (formally known as GMI) located in Flint, Michigan. He lives with his wife and three children in a suburb of Detroit, Michigan.

Bio: David is a Principal at System Strategy, Inc. David has over thirty years of experience in Software and Systems Engineering in multiple domains. David has experience in automotive radar design, software safety for offshore oil rigs, infotainment software design, and ISO 26262 functional safety. David is the author of the SysML for Beginners book series and speaks both Japanese and German fluently. David received a BA in Mathematics from the University of California San Diego and an MBA from the University of Texas McCombs School of Business.

11:00 – 11:30 am │ NATO Architecture Framework and The OMG UAF DMM

Christian Freihoff, IT Architect & National NAF Lead Expert (German Federal Office of Bundeswehr Equipment) and NAF Custodian (NATO's Architecture Capability Team)

Abstract: The NATO Architecture Framework Version 4 (NAFv4) was published in January 2018. Instead of using a proprietary meta-model, NATO selected two existing ones in the creation of NAFv4 compliant architectures. One of these is OMG's UAF DMM. During the OMG Technical Meeting in June 2019, Christian outlined the way ahead implementing a NAFv4-based adaptation of the UAF DMM (NAF@UAF) in NATO and the German armed forces. In this presentation at the OMG Summit in March 2022, Christian will provide an update of the current state of migration (from NAFv3.1 to NAFv4@UAF) as well as the development and use of NAFv4@UAF concepts and tools.

11:30 am – Noon │ Model-based Risk Analysis & Mitigation (MB-RAM) for Cybersecurity Using UAFP and RAAML

Rae Anderson, Multi-discipline Systems Engineer (MITRE)
Mary Tolbert, Principal Model-Based Systems Engineer (MITRE)

Abstract: This presentation will demonstrate how the combination of the Unified Architecture Framework Profile (UAFP) and the Risk Analysis & Assessment Modeling Language (RAAML) can facilitate cybersecurity risk analysis, ensuring that cybersecurity risks are addressed in the same model as the system architecture.

Noon – 1:30 pm │ Lunch Break

1:30 – 2:10 pm | KEYNOTE: Transferring Tacit Knowledge from IT Tribes to a Digital Model

Richard Wise, Senior Research Engineer (GTRI)
Michael Shearin, Assistant Branch Head – MBSE (GTRI)

Abstract: There is an ongoing effort in both the commercial industry and the Department of Defense (DoD) to digitally represent Information Technology (IT) enterprise architectures. These digital models aim to capture and elicit the tacit knowledge of these architectures into a form that is precise and exploitable by systems engineers, software engineers, data scientists and data engineers. We wish to not only document the architecture in a more formal manner, but also to interrogate these models for insight and execute what-if scenarios. However, this only works if the models accurately address the needs of the stakeholders and are well-formed.

The challenge in this knowledge transfer often lies in the broad spectrum of stakeholder groups (aka tribes) inherent in any domain that is categorized as a utility-minded infrastructure or support. Each of these tribes have their own interpretation of concepts within their domain that cause conflicting use and understanding of the same concept. For example, one person's metadata is another person's operational data model.

How do you accommodate multiple stakeholder viewpoints where each is equally valid? How do you distill down tribal vernacular to the essential knowledge in a precise, coherent and multi-viewpoint consistent way? Having a form or lens (i.e., perspective or viewpoint) to look through is paramount in making an intractable problem tractable. Fortunately, the UAF established such a framework that brings rigor to the problem through numerous views and viewpoints and robust tool support. However, using the UAF can be like bringing a tank to a knife fight. Furthermore, the rigid framework can seem overly confining and limit expressiveness. This presentation will explore via a case study the good, the bad and the ugly of transferring tacit tribal knowledge within the IT domain using the UAF.

2:10 – 2:40 pm | Through the Looking Glass: Using Architecture to Spark Innovative Thinking

Kristi Forino, Federal Acquisition Analysis Lead (Lockheed Martin)

Abstract: This presentation will address the role architectures and modeling can play in helping multi-functional teams work collaboratively to visualize opportunities for creating value across complex and dynamic landscapes

2:40 – 3:10 pm | Architecture-based Portfolio Management Using UAF

James Martin, Principal Engineer (The Aerospace Corporation)

Abstract: Capabilities, the lifeblood of an enterprise, can be managed effectively using portfolio management techniques. Capability roadmaps are commonly used to manage the deployment of new and improved capabilities to address key drivers and challenges that the enterprise faces. This presentation demonstrates how MBSE can enhance an organization's ability to plan for capability deployments, as well as the ability to more effectively manage its portfolios of facilities, people, processes, services, systems, technologies and other key enablers for the fielded capabilities. Specific enterprise modeling elements that can facilitate capability planning and portfolio management are also described. These new modeling elements are being incorporated into the next UAF update.

3:10 – 3:30pm | **Afternoon Break**

3:30 – 4:00 pm | **Hazard Analysis with The Aid of UAF Models**

Lars-Olof Kihlström, Principal Consultant (Syntell AB)

Abstract: Current functional safety standards tend to focus on single individuals (e.g., vehicles, machines). A project named Model Based Risk Assessment Safety Analysis (MBRASA) was initiated to study hazard analysis for system of systems. This presentation will discuss 1) how hazard analysis can be performed based on UAF models of specific system of system concepts, 2) how an extended hazard and risk analysis methodology can be facilitated by using the extrapolated system definition model and 3) how safety cases for models of the early phases can be used to facilitate swifter progress in getting systems ready for certification. Two model examples will also be described: 1) logistics facility and 2) truck platooning.

4:00 – 4:30 pm | **Tilting at Windmills: Drivers, Risk, Opportunity, Resilience and the 2021 Texas Electricity Grid Failure**

Matthew Hause, Principal Consultant (SSI)

Abstract: When the historic winter storms hit Texas in February 2020, the biggest problem was the lack of winterization of the renewable and fossil fuel-based generation systems. All the of the systems failed to various degrees. So why weren't these systems winterized? Mostly it was a lack of incentives. The government provided no financial incentives and did not mandate winterization. These winter storms were once-in-a-century events, and there was no business case with reasonable ROI to winterize. Companies that did manage to operate sold power and gas for up to 400% more than normal due to the lack of supply and increased demand. So, there was a built-in disincentive to not invest. This presentation will look at the risks, opportunities and drivers of the Texas electric grid, what caused it to fail and incentives to succeed in the future. We will also examine incentive systems gone wrong such as the Cobra Effect.

4:30 – 5:00 pm | **Closing/Q&A/Discussion**

Co-Chair: Aurelijus Morkevicius, Consultant Senior Manager (Dassault Systèmes)
Co-Chair: Laura Hart, Research Engineer Sr. Manager (Lockheed Martin)