

Tuesday Workshop and Tutorial Descriptions

Tutorial 2: The Method Framework for Engineering System Architectures

15:00 - 19:00

Organizers:

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The first part of this tutorial teaches the fundamental concepts and terminology underlying system architecture engineering including system, system architecture, architectural structure, architectural styles, patterns, and mechanisms, architectural drivers and concerns, architectural representations, architectural models, views, and focus areas, architectural visions. Attendees will also learn the meaning of system architecture engineering including the meanings of its component architectural work products, work units, and workers.

After being introduced to the ontology of concepts and terminology underlying system architecture engineering and MFESA, the second part of the tutorial will cover the many challenges currently facing system architects. These include general challenges associated with systems architecture engineering, challenges that are commonly observed in practice with the performance of architecture engineering, challenges that are observed with major current systems architecture engineering methods, and important reasons why system architecture engineering methods should be improved.

The third part of the tutorial teaches a set of important principles underlying system architecture engineering. Because MFESA was developed with them in mind, these principles are supported by its reusable system architectural engineering method components including the different types of architectural work products (e.g., architectures and architectural representations such as documents and models), architectural work units (e.g., tasks and techniques), and architectural workers (e.g., roles, teams, and tools) that perform the work units to engineer the work products.

The fourth part of the tutorial introduces the MFESA method framework. After clarifying the need for a method framework rather than the need for merely having one more generic architecture engineering method, the tutorial defines MFESA's component parts. These components include the MFESA ontology, the MFESA metamodel, the MFESA repository of reusable method components, and the MFESA metamodel for instantiating project-specific system architecture engineering methods out of the MFESA reusable method components. This is followed by a listing of the MFESA goals and objectives. This part of the tutorial also provides a description of the method framework's inputs, tasks, and outputs as well as a discussion of its relationship to other disciplines.

The fifth part of the tutorial introduces the attendee to the different kinds of architectural workers including architects, architecture teams, and architecture tools. This part covers the typical responsibilities, authority, and profile of the workers including their needed mindset, expertise, training, and experience.

The sixth part of the tutorial covers the ten basic architectural tasks within the MFESA repository of reusable method components. Although these tasks are typically performed in an iterative, incremental, concurrent, and time-boxed manner, they do have the following logical order. The first MFESA task is to plan and resource the architecture engineering effort. The second task is to identify architectural drivers including both individual requirements and more general concerns. Tasks 3 and 4, which are typically performed concurrently, are to create the initial architectural models and to identify opportunities for the reuse of architectural elements. Tasks 5 and 6, which are also typically performed concurrently, are to create candidate architectural visions and to analyze reusable components and their sources. The seventh task is to select or create the most suitable architectural visions. During task eight, the architecture is completed and maintained. During task nine, the architecture is evaluated and accepted by its stakeholders. Task ten ensures the integrity of the architecture and its representations.

The seventh and final part of the tutorial introduces the attendee to the MFESA metamodel for determining the project needs for one or more system architecture engineering methods, how to select the appropriate reusable system architecture engineering method components, how to tailor these selected component to meet the specific needs of the method stakeholders, how to integrate these selected method components into one or more consistent unified system architecture engineering methods, and how to verify the resulting integrated methods. ■