“Digital Mission Engineering (DME)
From Concept through Sustainment”

Company Information

Company Name: **Ansys Inc.**
Mailing Address: **2600 Ansys Drive, Canonsburg, PA 15317**
Company Website: **www.ansys.com**
Location of Facilities: **Worldwide**
Point of Contact: **Whitney Bobbitt**
Phone Number: **610-608-2278**
Email: **whitney.bobbitt@ansys.com**
CAGE Code: **0U014**
NAICS Code(s): **511210**
Business Size: **Large**
Socioeconomic Program Status (if any): **None**

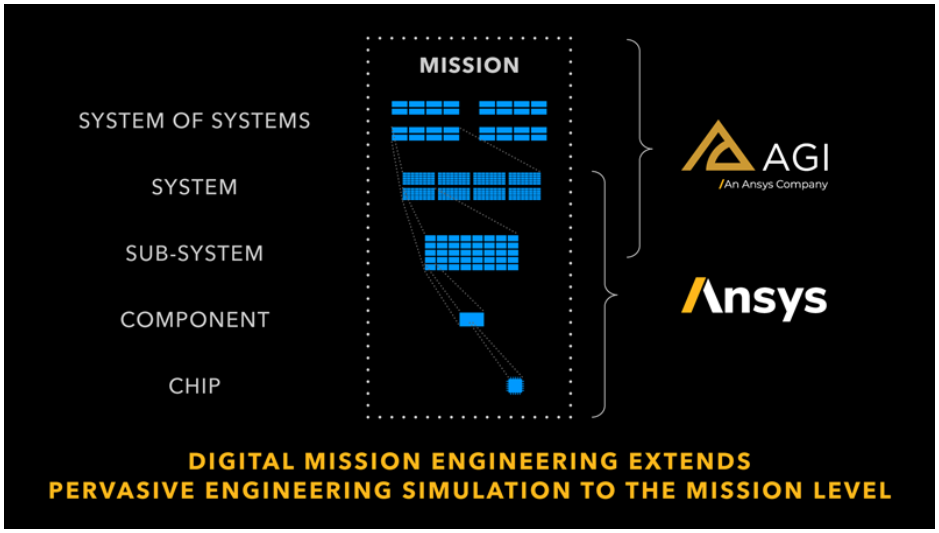
Software for Digital Mission Engineering and Systems Analysis

Ansys Systems Tool Kit (STK) provides a physics-based modeling environment for analyzing complex platforms and payloads in a realistic mission context and within its operational environments. STK allows users to model complex systems inside a realistic and time-dynamic three-dimensional simulation that includes high-resolution terrain, imagery, RF environments, and more. Select, build, or import precise models of ground, sea, air, and space assets and combine them to represent existing or proposed systems. Simulate the entire system-of-systems in action, at any location and at any time, to gain a clear understanding of its behavior and mission performance. STK has been perfecting what is know now as “Mission Engineering” for over 30 years now.

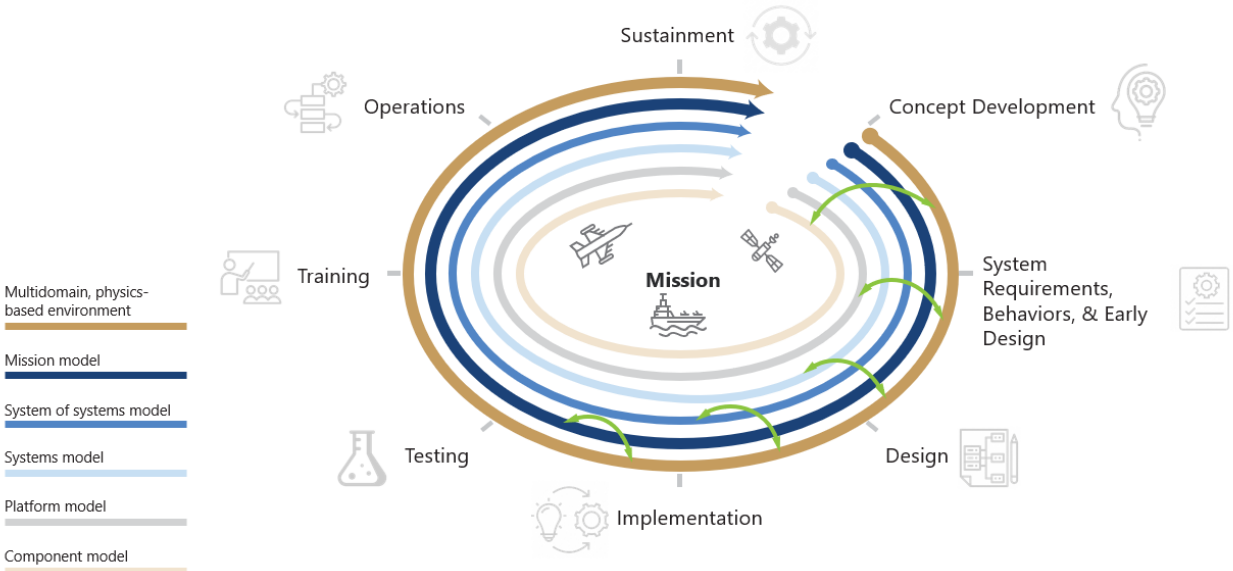
- Space Mission Systems Design
- Space Operations
- Air Mission Systems Design
- Advanced RF Systems Design
- Multidomain Concept of Operations
- Telecommunications Network
- Hypersonic Modeling
- Electro-optical and Infrared Sensor Systems
- Defensive System Evaluation

Digital engineering requires the use of digital modeling, simulation, and analysis to incorporate the operational environment and evaluate mission outcomes at every phase of the lifecycle. We refer to these activities as Digital Mission Engineering (DME). The keystone of DME is a persistent mission model, which serves as a common, dynamic environment to support system-to-component design, validation, operations, and sustainment. It ties models and data together, which enables you to deliver complex systems rapidly by connecting all decisions — engineering, architectural, operational — back to the mission. And, it empowers engineers to continuously validate capabilities and verify that mission requirements are being met.

The persistent mission model exists in both descriptive artifacts, using MBSE techniques, and in a physics-based form using a commercial toolset such as Systems Toolkit (STK). The latter is a data-driven, multi-domain, multi-physics and multi-scale environment that is architected for interoperability and scalability.



The persistent mission model provides realistic representations of the mission profiles (i.e., use-case scenarios) that sufficiently describe the intended system's use across its nominal and most stressful operating conditions. These Design Reference Mission (DRM) representations provide the physics-based clarity to guide system requirements maturation and development activities across engineering disciplines, system-to-component design and prototyping, and automated test and evaluation activities. These DRMs are utilized for virtual, SIL/HIL and live testing of the software and hardware elements during development, as well as of the complete system during development, DT and OT activities. STK enables continuous validation and verification of the maturing design, throughout the lifecycle. It's open API and data schemas allow for rapid integration of subsystem and component level simulations, configuration management of design iterations and traceability to the system baseline. This data-driven interoperability extends to all aspects of the MBSE descriptive model of the system under development. By using tools such as ModelCenter and the Behavior Execution Engine (BEE), the descriptive system architecture, parameters, and behaviors can be executed directly against the physics-based representations (generated from Ansys core-physics tools) of the mission and system for continuous requirements verification and system validation. Finally, as the system is built and its simulation matures into a Digital Twin, STK and can be used to simulate the realistic operating environment and operational behaviors of the deployed system. This enables the prediction of the system performance under actual and realistic, potential operating conditions. Simulating the actual operating conditions of the system also enables predictions of the future reliability, maintainability and lifetime of the system.



AGI is the industry leader in commercial modeling, simulation and analysis (MS&A) software for Digital Mission Engineering (DME) and Operations (DMO). AGI's suite of products, provides an integrated physics-based MS&A environment that provides engineers and systems operators the ability to analyze system performance in a simulated mission environment. AGI has a very unique role in the DME/DMO ecosystem where STK provides orchestration functions across the digital threads and twins by relating a multitude of models (systems of systems, sub-systems, platform, performance, environment, sensor models, etc.) to perform a variety of mission engineering functions. STK is configured to evaluate mission outcomes tied to requirements verification as defined by applications like DOORS and design artifacts provided by Cameo. AGI software is developed with an extremely robust set of APIs that allow its engine to be integrated with other COTS, GOTS and custom software tools within GBSD's IDE enterprise.

Over its 32 years of service, AGI has accumulated experience developing, deploying and using the most high-fidelity modeling, simulation, and analysis tools for digital mission engineering in existence. Because of AGIs ubiquitous presence within the industry, our users and our own engineers have decades of experience integrating our software with other COTS, GOTS, and custom engineering and simulation tools. In addition, we have decades of experience importing, utilizing, and analyzing customer data of every kind. By adhering to industry data and model standards, we have built in the flexibility required to integrate our modeling and simulation tools with almost any existing tools and data.