On March 14, 2005, Watts S. Humphrey, a fellow of the SEI, received the National Medal of Technology from President George W. Bush at a ceremony at the White House. The National Medal of Technology is given in recognition of outstanding contributions to the nation’s economic, environmental, and social well-being through the development and commercialization of technology products, processes, and concepts; technological innovation; and development of the nation’s technological expertise. Humphrey was recognized for his leadership, inspiration, and dedication to software engineers and software development organizations in industry, academia, the U.S. government, and other organizations worldwide.

Humphrey was instrumental in the development of the Capability Maturity Model® for Software, a collection of best software engineering practices that has been used by thousands of organizations throughout the world to improve their software development practices. Humphrey also initiated and led the development and introduction of the Personal Software Process™ and the Team Software Process™ methods that improve the work life of individual software engineers and their teams.

Humphrey is the author of nine books, including seven in the Addison-Wesley SEI Series in Software Engineering: PSP, A Self-Improvement Process for Software Engineers, and TSP: Leading A Development Team were published in 2005.

“We have found that by applying to software the principles that made the industrial revolution possible, software engineering teams can achieve improvements in quality, predictability, and productivity that exceed our wildest dreams. We call this intellectualization; and if industrialization was the great achievement of the 20th century, intellectualization is the great challenge of the 21st century.”
— Watts S. Humphrey

“With analysis and integration tools, AADL will provide a strong foundation for rapid, predictable, computer-based system design, development, and evolution. It will be used to reduce program risk, rework, and integration costs and add a powerful mechanism for lifecycle system modernization.”
— Bruce Lewis, chairman of the SAE AS-2C AADL Subcommitte, experimental developer, U.S. Army RD&E Command

For embedded software systems—such as the ATM on the corner or the guidance system in a fighter plane—reliability, safety, and performance are critical. Yet, software architects have been largely unable to assess early in the design process the impact of decisions about those properties, if at all.

Developed under the auspices of the Society of Automotive Engineers (SAE) and published in November 2004, the Architecture Analysis and Design Language (AADL) standard provides architects with a common language precise enough to specify and analyze embedded real-time systems long before integration time. Peter Feiler, senior member of the technical staff at the SEI, was technical lead, author, and co-editor of the AADL standard.

The AADL standard gives users the ability to model architectures textually and graphically and to exchange models via the industry-standard XML format with other analysis tools. The standard already has widespread application in fields that use real-time engineering practices, including avionics, robotics, and the aerospace and automotive industries. Organizations such as the U.S. Army, Honeywell, Rockwell-Collins, Lockheed Martin, General Dynamics, Airbus, the European Space Agency, Avlog, Dassault, EADS, Ford, and Toyota are voting members of the standard subcommittee and are actively investigating incorporating or extending it.

To encourage its adoption, the AADL standard supports open-source tool development and integration with commercial modeling tools, including UML-based tools through its XML interchange format. The SEI and Airbus have developed open-source tools, and commercial tools are emerging.

The SEI currently is helping organizations understand how to apply the standard in their development processes by holding workshops and developing training materials and a public course, Model-Based Engineering with SAE AADL.