

Architectural Coaching

Learn how to create an architecture that responds to critical system qualities.

SEI Expertise in Software Architecture

For more than two decades, the SEI has been instrumental in creating and developing the field of software engineering known as software architecture.

A system's software architecture is the glue that holds every phase of a project together for all of its stakeholders. It is the depiction of a system that aids in understanding how the system will behave. The architecture is one of the major mechanisms that allow stakeholders to communicate about the properties of a system.

Software architecture is the blueprint for both the system and the project developing it, defining the work assignments that must be completed. It is also the primary carrier of system qualities such as performance, modifiability, and security, none of which can be achieved without a unifying architecture.

The SEI has a long history of working with government, industry, and academia to create, mature, and transition architecture-related engineering practices. We can help organizations facing software system problems such as

- poor quality—seen in, for example, systems crashing or behaving unpredictably, or users judging that a system is unusable
- slow time to market—seen in missed integration deadlines due to difficulty in identifying root causes of problems

Architectural Coaching

The SEI provides architectural coaching to customers who have decided to integrate architecture with their development practices. SEI architects work directly with a customer's developers to establish an architecture and architectural process or to optimize an existing architecture and its processes.

We can answer questions such as these:

- How do you get started with or optimize your software architecture development?
- How do you establish architectural requirements for your product or product line?
- How do you scope your architecture?
- How do you develop architectural designs?
- How do you provide effective documentation for your architecture?
- How do you use architectural evaluation in developing your product or product line?
- How do you architect in Agile settings?

How Does It Work?

SEI architects work directly with your development staff to assist and train them in

- establishing or optimizing an architectural process
- defining an architecture for a single product or a product line

About the SEI

The Software Engineering Institute is a research and development center that works with defense and government organizations, industry, and academia to advance the state-of-the-art in software engineering and cybersecurity to benefit public interest. Part of Carnegie Mellon University, the SEI is a national resource in pioneering emerging technologies, cybersecurity, software acquisition, and software lifecycle assurance.

Contact Us

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We can help with any number of architecture-related activities:

- **Establishing the architectural requirements:**

SEI architects work with you to derive architectural requirements by analyzing the business drivers and system context as well as the issues deemed critical to system success by the product stakeholders. The goal is a specification for the architecture that directs the architects to create a structure for the system that is sufficient to ensure success in the eyes of the stakeholders. These requirements prevent creation of an architecture that is overly complex or that strives for unnecessary elegance at the expense of critical system properties.

- **Scoping the architecture:** Before defining an architecture, we work with your developers to determine how many of the system-design decisions should be established by the architecture of the system. This scope delimits the activities of application developers, allowing them to concentrate on what they do best.

- **Defining an architecture:** SEI architects work with you to develop architectural structures and coordination strategies that satisfy the architectural requirements. Alternative architecture solutions may be proposed and analyzed to identify an optimal solution for the product or product line being developed. When product lines are involved, we also help you adapt the product line architecture to specific product requirements and fully develop the architecture for an individual product.

- **Evaluating the architecture:** SEI architects work with you to determine when and what methods of architecture evaluation are appropriate. Then we help you apply the results to improve the developing architecture.

- **Documenting the architecture:** To be an effective plan for a product, the architecture must be documented in sufficient detail and in an easily accessible form for developers and other stakeholders. SEI architects work with you to determine what views of the architecture are useful for your stakeholders, the amount of detail required, and how to present the information efficiently.

SEI architects can work with you in a variety of coaching modes. Coaching may involve both direct participation in the development of the product architecture and training your staff in software architecture development and associated architecture process. Training may be accomplished by academic instruction, training by example, or both. The overall goal is to help your staff become proficient in all aspects of software architecture design for products or product lines.

Benefits

Architecture coaching helps developers learn how to create an architecture that responds to critical system qualities in the product. If you are a part of

- a software development organization that develops medium- to large-scale software-intensive systems or
- an organization that develops complex software systems or systems whose success rests on critical non-functional system attributes such as reliability, performance, security, and maintainability,

we can help!

SEI architects will work with your development staff and, when appropriate and desirable, with your contractors or subcontractors. For additional technical details or to arrange architectural coaching services, please contact us.

Software Architecture Training

The SEI offers software architecture courses and certificate and certification programs that are based on extensive SEI and community experience in architecting software-intensive systems.

More than 20,000 people from more than 1,800 organizations have attended courses in the SEI Software Architecture Curriculum, and more than 2,500 people have earned software-architecture-related certificates.

Visit our website to see the complete set of architecture-related offerings and register for upcoming courses:

www.sei.cmu.edu/education-outreach/credentials
www.sei.cmu.edu/education-outreach/courses

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