SIEMENS
Ingenuity for life

Creating high-quality embedded software

Using Capital Software Designer and Software Improvement Group's Sigrid

Benefits

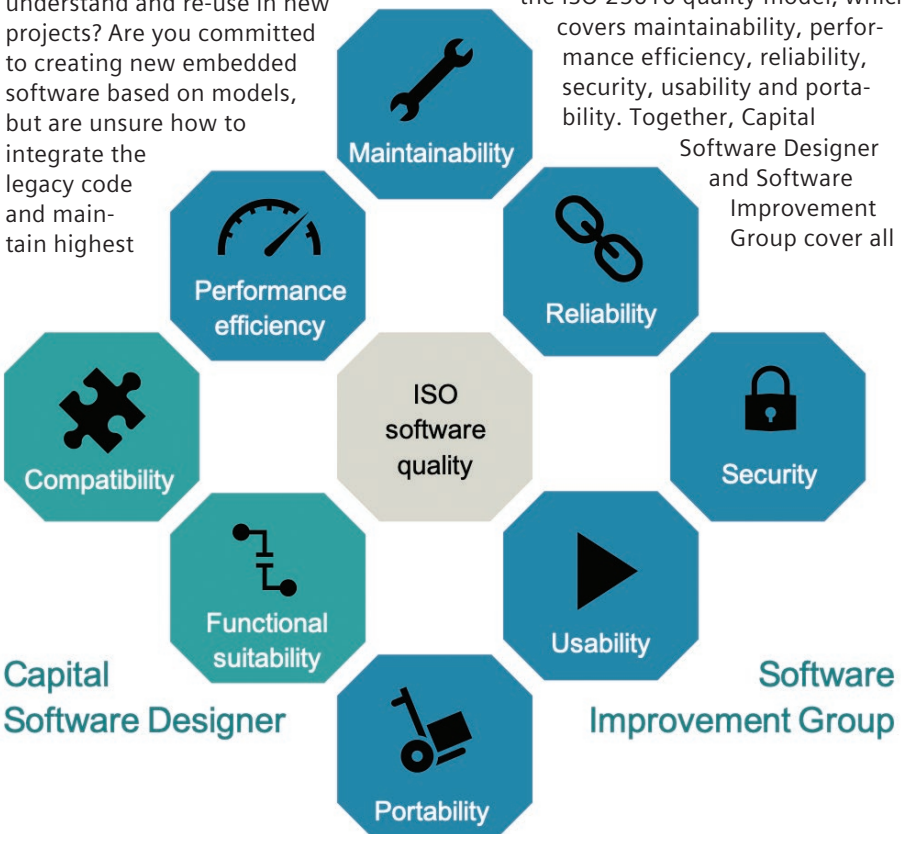
- Create interface-compliant and functionally suitable embedded software by design
- Prevent software decay from the start by measuring and tracking key maintainability metrics from ISO 25010
- Feed maintainability insights back to improve software architecture
- Ensure performance efficiency, reliability, security, usability and portability for your embedded software
- Refactor and capture legacy embedded C code in models using the best of tooling and services from Siemens Digital Industries Software and Software Improvement Group (SIG)

Summary

Is your organization dependent on large embedded C code from eras where efficient execution required low-level coding, and that becomes difficult to understand and re-use in new projects? Are you committed to creating new embedded software based on models, but are unsure how to integrate the legacy code and maintain highest quality standards demanded by software taking safety-critical tasks?

Capital® Software Designer and Software Improvement Group's Sigrid software monitor can save the day.

Capital Software Designer is the solution for efficient and sound model-based specification, interface compatibility control, integration, and functional verification and validation of embedded application software. It seamlessly integrates with the Sigrid software monitor for measuring and tracking software quality according to the ISO 25010 quality model, which covers maintainability, performance efficiency, reliability, security, usability and portability. Together, Capital Software Designer and Software Improvement Group cover all



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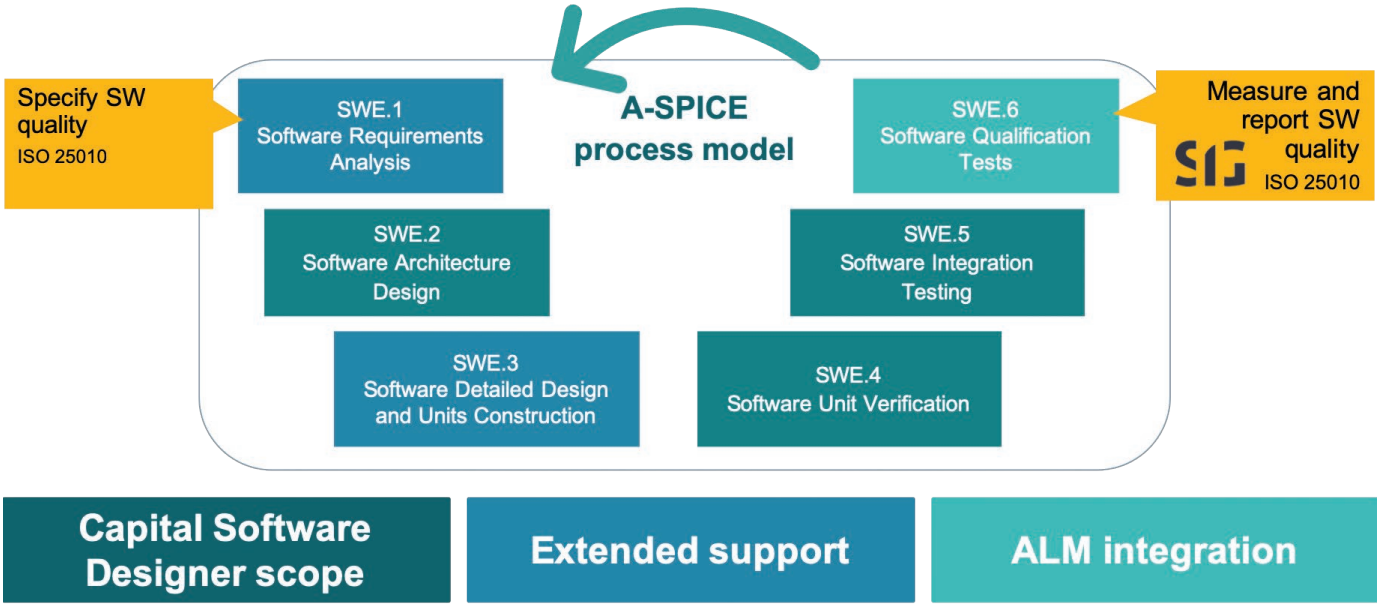


software quality aspects as defined by the ISO 25010 standard.

Capital Software Designer – specify and validate interfaces and functionality

Capital Software Designer enables software architects to create variant-aware software architectures and import or merge them from multiple sources. The architecture enrichments cover data types and physical units, a data dictionary with enforceable and testable data properties, behavior contracts in the form of pre- and post-conditions, and timing specifications for cyclic blocks. Enriched software architectures are analyzed for compatibility and consistency with respect to all dimensions of the contracts. Architectures are also used to model re-usable test cases long before actual implementation, helping clarify requirements and functional specifications.

Legacy C code representing key company values can be readily imported and converted into a data flow software architecture using Capital Software Designer, thereby making enterprise assets available for your next model-based projects and programs.

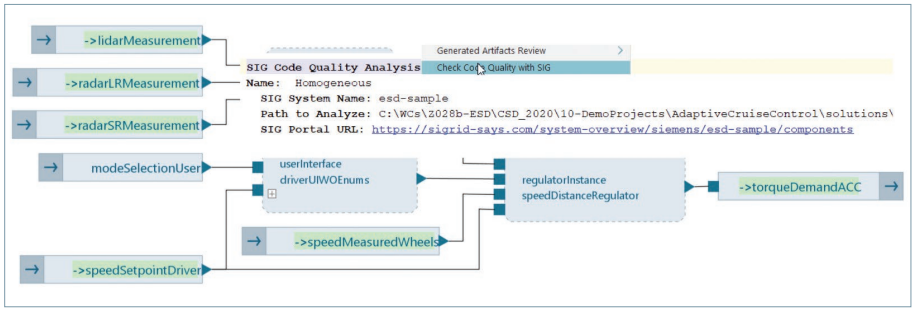
Interface validation and best-in-class functional verification and validation methods using testing paradigms and formal methods ensure compatibility and functional fit.

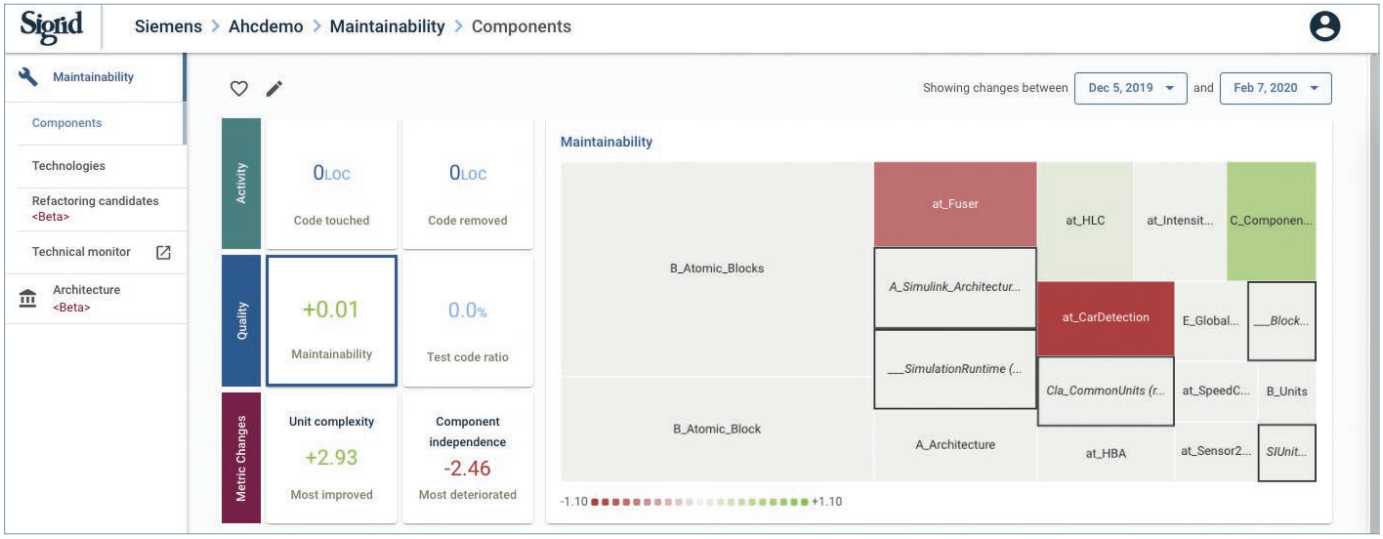
Capital Software Designer offers an integration with Software Improvement Group's Sigrid software monitor that makes software quality a verifiable and actionable aspect similar to the functional verifications offered by Capital Software Designer.

In summary, using Capital Software Designer helps prevent software decay from the start.

Software Improvement Group – measure and track software maintainability and more

With the Sigrid for Capital Software Designer integration, Software Improvement Group leverages the innate capabilities of Sigrid to bring software quality analysis to embedded software development. The integration allows architects and testers to gain insight in the developed quality and to trigger and track focused quality improvements until the desired level is achieved.





The scores in this model are based on a comparison with other systems that are in the extensive SIG benchmark – which contains software quality measurements for more than 25 billion lines of code that have been collected for more than 18 years. SIG quality measurements not only score the systems on software quality, but also tell how the software is doing compared to other systems in the market, which is a competitive advantage. The IT industry is constantly evolving and improving, which is why SIG performs a recalibration of this model every year. This means the definition of quality thresholds can be done based on actual industry averages giving it more relevance and neutral reference.

Complementary services offering
Siemens Digital Industries Software and Software Improvement Group offer mutually complementary services with our products to help you on your journey towards better software:

- SIG experts are ready to help you improve your software along each of these dimensions: performance efficiency, maintainability, security and usability. Get rid of outdated coding styles obsoleted by modern compilers and get your code ready for the future, which will immediately resonate in increased agility and efficiencies.
- Siemens is ready to assist you to extract the software architecture from your legacy code bases, to associate the legacy code with that architecture, and to re-use and extend this code in new model-based embedded software projects.

While our products are designed for ease of use and ease of learning, and learning paths are available for both, scalable and flexible services offerings are ideal for kick-starting your projects and accelerating the learning curve.

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