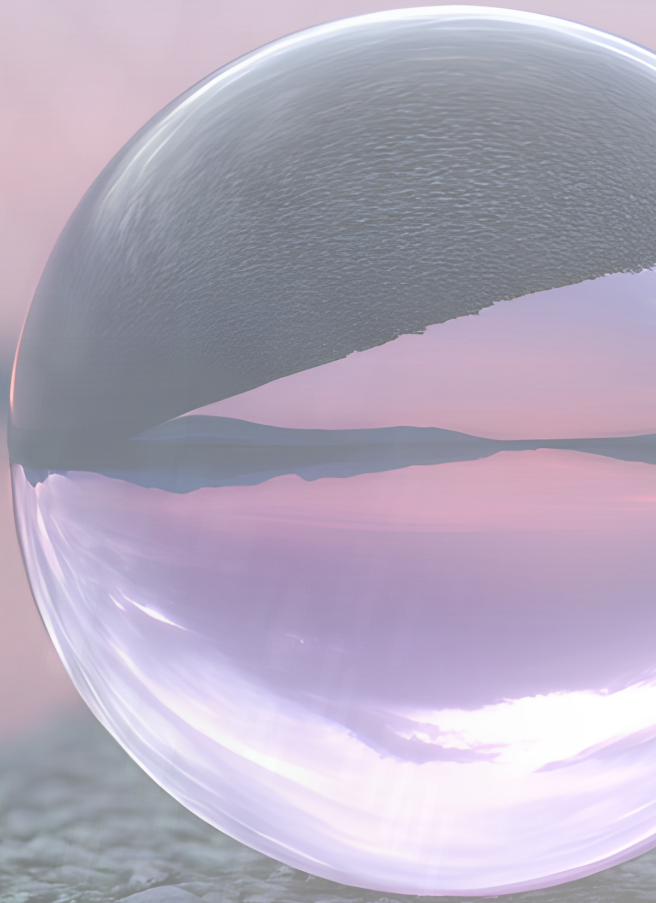
Software Center | Continuous Compliance

Continuous Compliance

World-leading applications of digital infrastructure in Swedish areas of strength



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Accelerating the industry's digital transformation

The initiative System-changing initiatives is a strategic effort by the program Advanced Digitalization, funded by Vinnova, the Swedish Innovation Agency. Six large project have been selected based on their impact potential with focus on electrification, data flows, AI and digital infrastructure in aim to sustainably accelerate the industry's digital transformation.

The Advanced digitalisation programme is an industry-driven programme and promotes Sweden's and Swedish industry's ability to create future digital solutions. Projects within System-changing initiatives contribute to Sweden's shared ability to create and utilise the opportunities of digitalisation. In the long term, this will also strengthen the competitiveness of Swedish industry, and contribute to the image of Sweden as an attractive country for research- and innovation in advanced digitalisation.

The Continuous Compliance project is part of World-leading applications of digital infrastructure in Swedish areas of strength, within System-changing initiatives. The Continuous Compliance project is initiated by Software Center within the framework of the competence center CoFDig, Continuous Digitalization.

World-leading applications of digital infrastructure in Swedish areas of strength

In order for Swedish industry to take a leading position in the application of digital infrastructure, advanced use cases for end-to-end solutions are required, covering a significant part of a value chain and based on the latest digital infrastructure. The use cases will be demonstrated as prototypes in a realistic environment, including the latest available technology in wireless communication networks and digital computing infrastructure. By utilizing the latest technology, Swedish industry will have the opportunity to develop innovative and effective solutions that strengthen their position in the global market. The purpose of demonstrating use cases is to give Swedish industry the opportunity to absorb knowledge, while actively working to remove obstacles to the industry's continued implementation. Demonstrating use cases will pave the way for industry-changing use cases in commercial application in the long term.

The project will create physical and digital environments where actors can jointly identify, develop, test, verify, learn and collaborate on issues of both a technical and other nature. The emphasis will be on technical aspects, but challenges in areas such as business models, interfaces, business chains, security issues, skills shortages and regulatory barriers will also be addressed. The project will analyze and demonstrate scalability in a long-term perspective.

Impact goals

Industry-changing use cases, on the latest generation of digital infrastructure, will be continuously translated into commercial application.

Continuous Compliance

The project aims to develop and demonstrate continuous compliance as a system-changing application of advanced digital infrastructure for software-intensive systems. The core idea is to replace today's fragmented, document-centric, and largely manual compliance practices with automated, lifecycle-wide capabilities that span regulatory monitoring, system development, deployment, and run-time operation. Building on the feasibility study, the project will combine AI-enabled automation, advanced computation, and pervasive connectivity to support continuous interpretation of regulations, automated generation and maintenance of compliance evidence, and real-time monitoring of deployed systems. This enables organizations to maintain compliance dynamically as regulations evolve and systems change through updates, reconfiguration, and adaptive behavior. The project targets compliance domains such as safety, cybersecurity, privacy, and emerging AI-related regulations, where requirements increasingly extend beyond design-time certification into operational phases. The project adopts a systems perspective, addressing not only technical solutions but also organizational processes, toolchains, and interactions with regulators and certification bodies.

Through large-scale collaboration and demonstrations in real or realistic industrial environments, the project will establish reference solutions, shared infrastructures, and practices that can be reused across sectors where Sweden has strong industrial positions.

This project idea directly builds on the validated needs, solution areas, and industrial commitment identified in the feasibility study, which demonstrated both the urgency of the compliance challenge and the potential of digital infrastructure and AI to address it in a systemtransforming manner.

Project objectives

The overall objective of the project is to enable continuous, automated, and scalable regulatory compliance for software-intensive systems, thereby reducing compliance burden while strengthening innovation capacity and competitiveness in Swedish industry. More specifically, the project aims to:

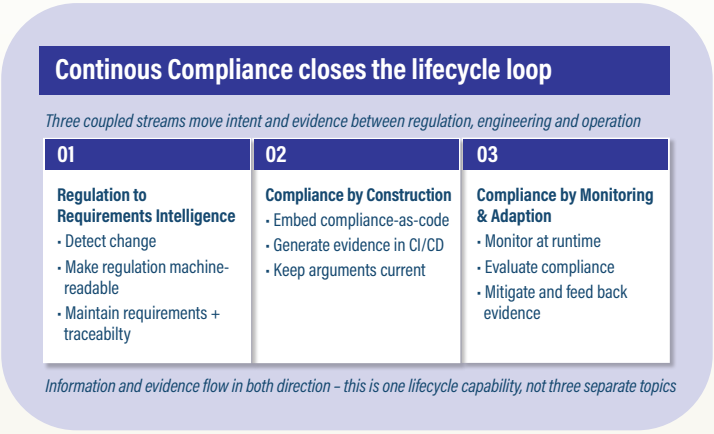
1. Develop and integrate automated methods for monitoring and interpreting regulatory changes, ensuring that evolving legal and standardization requirements are continuously reflected in system requirements and processes.
2. Enable automated collection, maintenance, and validation of compliance evidence throughout system development, including documentation, traceability, and risk assessments.
3. Establish capabilities for run-time monitoring of deployed systems, providing continuous verification that operational behaviour remains within mandated safety, security, and privacy bounds.
4. Demonstrate end-to-end continuous compliance solutions in real or realistic industrial value chains, using advanced digital infrastructure for data collection, processing, and analysis.
5. Support organizational and ecosystem transformation by developing shared practices, reference architectures, and validation environments that facilitate adoption across sectors.
6. Strengthen competence among industrial and academic partners in AI-enabled compliance automation and lifecycle-wide assurance.

These objectives are directly derived from the feasibility study's findings, which highlighted the lack of end-to-end compliance automation, the growing importance of operational compliance, and the need for collaborative solutions that combine technical innovation with organizational change.

Project structure

Technology areas

The project brings together industrial partners facing complementary software and compliance challenges, organized into Technology Areas that reflect differences in scale, lifecycle, variability, and regulatory exposure. This industry-first structure ensures that the project is firmly anchored in real needs. The academic partners then provide the scientific foundations, methods, and validation capacity required to generalize, integrate, and scale solutions across domains.'



1 Vehicle and mobility platforms

This area is characterized by platform-based development of software-defined vehicles produced at scale and operated over long lifecycles. Software platforms are reused across vehicle families while evolving through frequent updates, increasing autonomy, and expanded connectivity. Regulatory pressure related to functional safety, cybersecurity, emissions, and AI requires compliance to be maintained continuously as vehicles change after deployment. The partners contribute strong competence in automotive systems engineering, safety-critical software, platform governance, supplier integration, and industrial DevOps. Their participation grounds the project in high-impact use cases where continuous compliance must coexist with rapid innovation. They benefit from methods that automate compliance evidence across platforms, manage regulatory change efficiently, and enable runtime compliance monitoring for connected and autonomous vehicles.

2 Large-scale customized system deployments

This area covers software-intensive systems deployed in relatively few instances, where each instance is large, highly customized, and continuously evolving during operation. Systems are distributed and software-defined, integrated into customer-specific environments with high requirements on availability, performance, and security. Compliance challenges increasingly concern operational behavior rather than static design artifacts. The companies contribute deep expertise in distributed systems, configuration and deployment management, and operational monitoring. Their experience ensures that the project addresses compliance beyond development-time processes. They benefit from approaches that connect development-time evidence with runtime monitoring, reducing the cost and risk of maintaining compliance in live, evolving systems.

3 Technology Area – Mission-critical and high-assurance systems

This area is defined by systems where safety, security, and trustworthiness dominate. Software is developed under strict regulatory and certification regimes, often with lifecycles spanning decades. Changes are costly and certification-heavy, creating tension between assurance and adaptability. The partners bring mature competence in regulatory interpretation, certification, traceability, and secure software development. Their involvement ensures credibility with regulators and certification bodies. They benefit from techniques for selective re-certification, reuse of assurance evidence, and controlled evolution of certified systems as regulations and operational contexts change.

4 Platform-centric mass products

This area comprises high-volume products built from reusable software platforms and deployed in very large numbers as cost-sensitive embedded systems. Product families span many variants and generations, creating challenges in variability management, testing, updating, and longterm maintenance. Regulatory requirements increasingly apply across entire portfolios. The companies contribute extensive experience in product-line engineering, embedded platforms, and industrialized development for large device fleets. Their participation ensures scalability and cost efficiency. They benefit from methods that support continuous compliance across variants and generations, improving traceability while reducing manual effort.

5 Cross-domain industrial solution providers

This area spans software-intensive solutions delivered across multiple industrial domains and customer environments. Software is embedded in automation systems and industrial platforms that must integrate with heterogeneous infrastructures and regulatory regimes. These partners contribute cross-domain experience in industrial automation, embedded platforms, and system integration. They support generalization of project results beyond single sectors and benefit from harmonized compliance methods reusable across business units and customer contexts.

Directions

1 Regulation to Requirements Intelligence
- LLMs-based encoding of dependability-relevant legislations and standards
- AI-supported continuous development of assurance cases
- Continuous monitoring of software provenance

Direction leader:
Dániel Varró
Linköping University

2 Compliance by Monitoring and Adaptation
- Runtime Traceability
- Run-time compliance monitoring using Digital Twins
- Run-time adaptation and policing for continuous compliance

Direction leader:
Jan Carlson
Mälardalen University

3 Compliance by Construction
- Framework for Explainability of AI-Enabled Software Products
- Compliance Evidence as a By-Product: A Reference Model for Compliance as Code
- Automated collection of compliance evidence

Direction leader:
Miroslaw Staron
University of Gothenburg

4 Organizational Transformation for Continuous Compliance
- Data collection and management for continuous compliance
- Lifecycle Integration of Continuous Regulatory Compliance
- Cross-organizational continuous compliance

Direction leader:
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