ITEA 4

Project Profile

GENIUS

Generative AI across software development phases

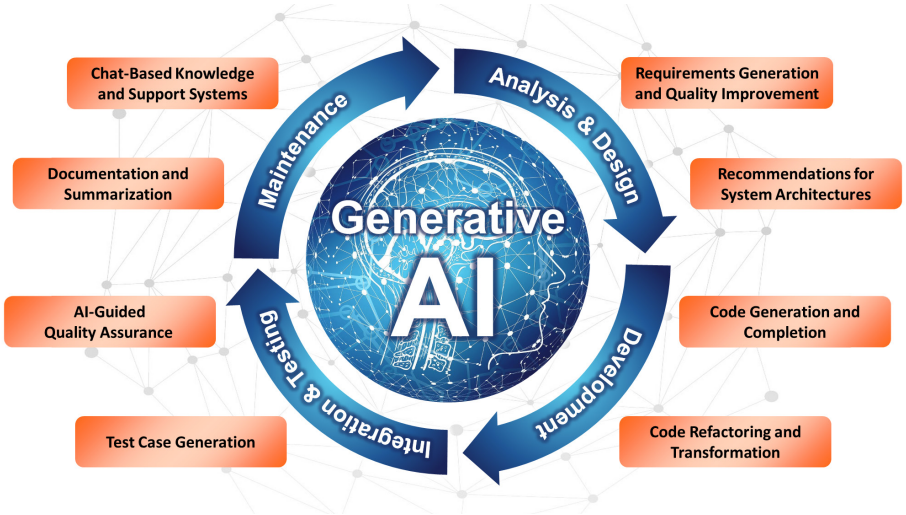
To increase quality and efficiency in software development, the ITEA project GENIUS (Generative AI for the Software Development Life Cycle) will integrate generative artificial intelligence (GenAI) into existing ecosystems while providing guidelines and best practices to ensure data security, privacy and reliability.

Addressing the challenge

Generative AI, based on large language models (LLMs) such as ChatGPT, is predicted to bring strong productivity benefits and a corresponding business impact over the next decade. Software developers, for instance, can complete coding tasks up to twice as fast with generative AI. However, direct application in software development lifecycle (SDLC) processes remains experimental due to critical uncertainties in areas like security, data privacy and reliability. Combined with a shortage of skilled software engineers, there is a pressing need for increased efficiency in development processes.

Proposed solutions

GENIUS will address these challenges by enabling intelligent support across all SDLC phases, focusing on automation, semantic enrichment, and the use of company-specific knowledge to increase productivity and reduce lead times. As a foundation, the project will develop conceptual frameworks and modular plugins, tools and services that allow easy interchangeability as new developments arise. Domain and company-specific solutions will then be developed for use cases in sectors as diverse as industrial automation, telecommunications, healthcare, and enterprise software. These innovative methods and tools, adapted or integrated as plugins into existing ecosystems, will support software engineers with generated software artifacts (such as requirements, code and test cases) and with software quality analysis, improvements and recommendations via professional chat functionalities. This will be complemented by comprehensive guidelines for leveraging LLM tools and best practices for software developers in their usage, allowing them to establish data security and privacy according to regulations. The result will be context-aware, trustworthy and human-centric solutions that integrate AI safely and effectively in real-world development settings.



GENIUS solutions integrating GenAI across all phases of the software development lifecycle

Projected results and impact

GENIUS is ultimately about increasing productivity by integrating generative AI into software engineering processes, driving innovation and transformative advancements via generative AI's ability to provide intelligent suggestions and support for requirements analysis, implementation and testing. Concretely, the benefits include an expected 20% reduction in lead time across SDLC phases, a 30-70% reduction in test case creation time, and a 10% decrease in software defect density. In addition, knowledge retrieval time is expected to improve by at least 50%, accelerating onboarding and decision-making. These improvements will lead to faster time-to-market, increased product quality and improved maintainability – tangible competitive advantages that will help participating companies to take advantage of an expected growth in the global generative AI in software development market from USD 25.4 million in 2022 to USD 169.2 million by 2032. By shifting developer effort from creation to validation and reuse, GENIUS will also help free up capacity for higher-value tasks and support the integration of new talent, helping to promote a culture shift towards generative AI within companies and across domains.

Project partners

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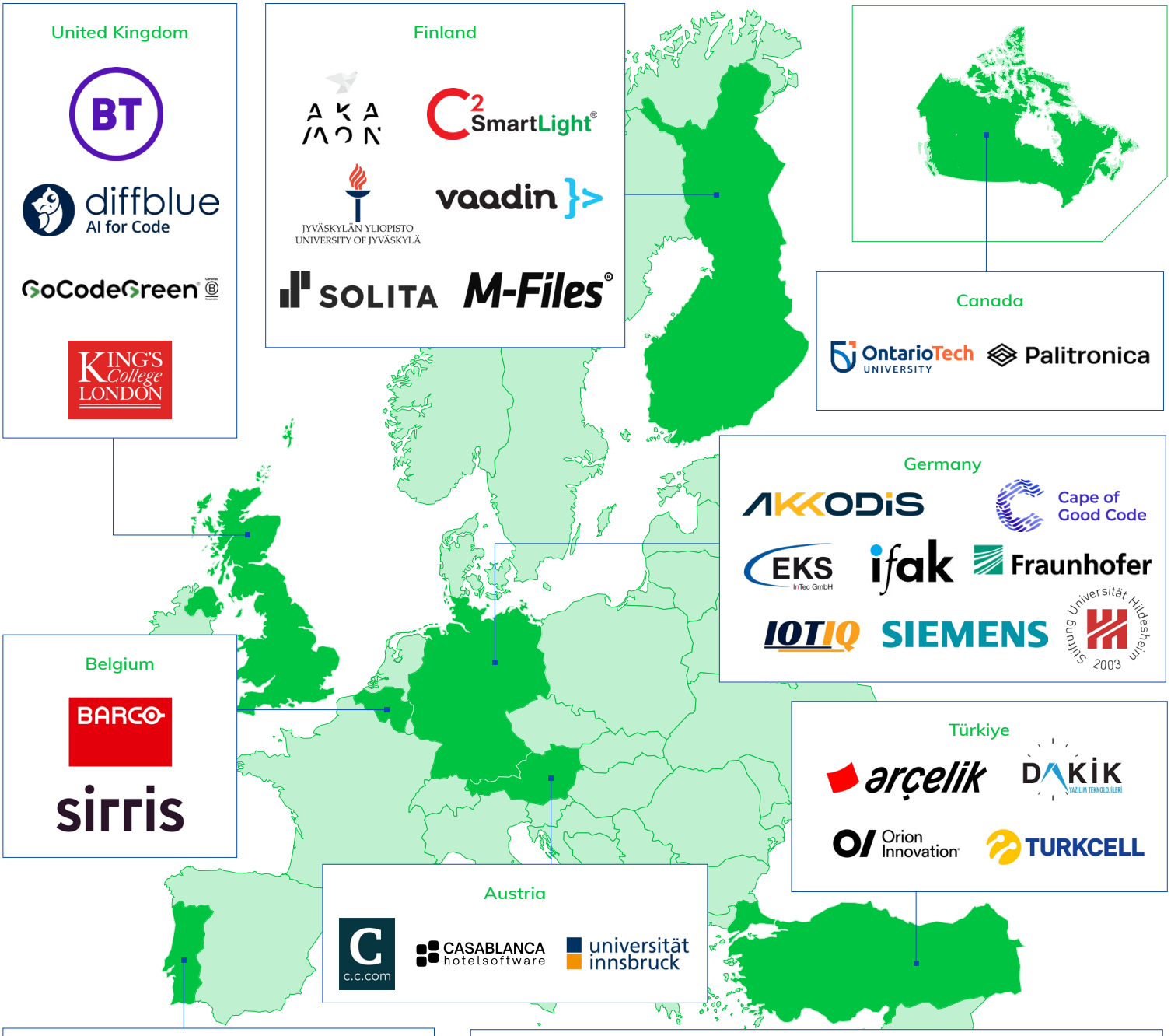

Project start
November 2024

Project end
May 2028

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Project website
https://itea4.org/project/genius.html

ITEA is the Eureka RD&I Cluster on software innovation, enabling a large international community of large industry, SMEs, start-ups, academia and customer organisations, to collaborate in funded projects that turn innovative ideas into new businesses, jobs, economic growth and benefits for society. ITEA is part of the Eureka Clusters Programme (ECP).

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