



## Success Story

### **Making Code Quality Measurable** **From basic research to practical error prediction**

As modern software becomes more complex, the risks of errors, security vulnerabilities and costly fixes increase. The Complexity and Resilience Research Group (CORE) at the COMET Center SBA-K1 NGC has developed an innovative framework that enables the quality of software to be measured and predicted throughout its entire lifecycle.

Drawing on insights from biological ageing research, the framework analyses over 40 technical and social parameters per file and commit. These include file age, change frequency and dispersion of changes, as well as factors such as team size and task distribution within the development team.

In a comprehensive study involving 2.4 million commits from 33 heterogeneous open-source projects, published in *Big Data and Cognitive Computing* in 2025, SBA Research demonstrated that files with long lifespans, frequent edits and widely dispersed changes are significantly more prone to errors. Notably, social parameters often influence error density more strongly than purely technical metrics.

#### **Research as a driver of economic value creation**

These findings are now being put into practice in collaboration with COMET partner OBJENTIS. As specialists in professional software testing, OBJENTIS brings extensive expertise in test automation, quality assurance and product development to the partnership. This makes them ideal for validating and further developing the new metrics in real-world customer projects.

“With our research, we aim to contribute to the early detection of software problems and establish new best practices. We achieve this by viewing software as a living entity whose dynamics and evolution we can map and predict over time,” explains Kevin Mallinger, Head of SBA’s CORE Group.

“Our customers face significant challenges in managing the complexity of modern software environments. These new testing strategies enable us to help them identify areas of risk early on, before security issues, bugs or crashes occur,” says Roland Tscheinig, CEO of OBJENTIS, highlighting the innovative nature of the research findings. “We look forward to expanding the framework together, with the long-term goal of transforming this service into a commercial product.”

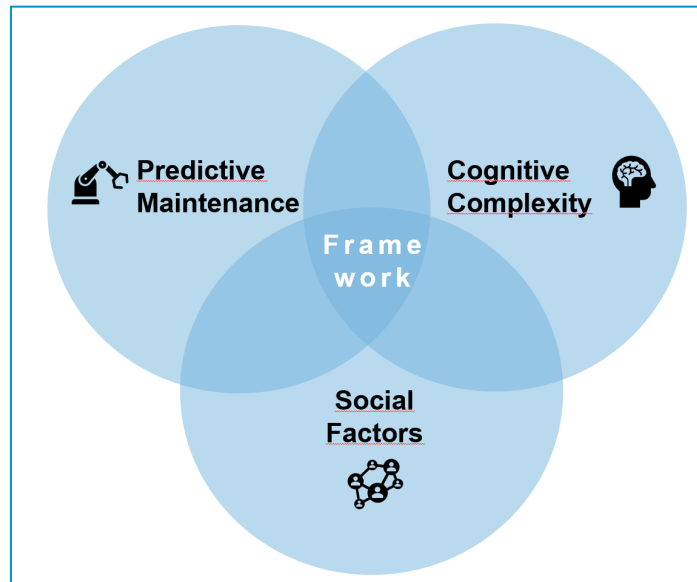


Figure 1: Integrated Software Ecosystem Assessment and Evaluation © 2026 SBA Research

## Tangible benefits for industry partners

COMET partners such as OBJENTIS benefit directly from this collaboration:

- More precise prioritization of testing efforts through data-driven risk assessment
- Early detection of error-prone code areas, thereby reducing follow-up costs
- Strengthening of in-house testing services with innovative, scientifically grounded metrics
- The opportunity to create new, data-driven offerings for customers, ranging from targeted quality assurance to long-term software resilience

## Funding instruments as a framework for knowledge development and innovation

This is an excellent example of how SBA-K1 NGC combines basic research with industrial expertise. In collaboration with OBJENTIS, scientific findings are being transformed into a practical tool that measurably improves code quality, providing direct benefits for quality assurance, risk management and the development of competitive, resilient software products.

### Project partner:

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