

SOFTWARE QUALITY MEASUREMENTS IN THE PLC LANGUAGE

CODING BY ALL RULES OF ART

Code quality is a sub-aspect of software quality with which, in particular, non-functional requirements such as conformity, intelligibility, adaptability and testability are to be met and supported. Since software development is a creative process, an explicit division into „good“ or „bad“ code is not easy. Nevertheless, code quality can be described using suitable software metrics.

Analyze quality characteristics?

Tools for evaluating software quality in the high-level language area already support developers and their teams in maintaining critical, non-functional aspects of their software. Programming languages that are not supported by conventional tools (IEC 61131) are used especially in machine and plant construction.

However, the software developed is subject to the same security and quality requirements as high-level language software, but cannot be checked manually without automatic analysis due to the complexity and size of the projects.

An analysis of quality metrics in the area of PLC languages enables machine and system builders to apply the advantages of code quality measurement methods to parts of their software projects that have not yet been analyzed.



We are guided by industry standards!

In cooperation with the company TIOBE, which is established in the field of software quality, we are developing a tool that can analyze software in the languages of IEC 61131 for compliance with quality metrics.

The metrics are based on the existing TIOBE Quality Indicators. These were created by following the requirements of the ISO standard on the subject of code quality (ISO 25010) and have become established in the industry.

Besides, an interface to the existing TIOBE TiCS framework is implemented, which means that the advantages of graphical visualization and database features can also be used for PLC languages.



APPROACH

Sound recommendations

The software tool enables developers to check their projects or individual files for violations of standardized quality metrics:

- Code Duplication
- Cyclomatic Complexity
- Security
- Fan Out
- Code Coverage

- Compiler Warnings
- Abstract Interpretation
- Coding Standards

In conjunction with the TIOBE TiCS framework, features for continuous integration can be used. Including database services and trend histories with a graphical user interface for easy tracking of software quality over the life of the analyzed software.



“The PLC projects of our customers are highly complex and are subject to the strictest requirements. Our tool makes it possible to reduce this complexity.”

Laurenz Noack
Software Engineer

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BENEFITS

Compliance with software quality metrics enables:

- Enhanced readability
 - Easier bug fixing
 - Faster training of new employees
 - Improved teamwork
- Improved testability
 - Code that was previously untestable can be tested now
 - Tests can be standardized and automated
- Better adaptability/modularity
 - Flexible code changes
 - Independence of modules
 - Long durable software

SERVICES

We offer you!

- In-house training
 - Coding Standards
 - Code Reviews
 - Automated tests and fields of application of the analysis tools
- Creation of a comprehensive analysis report of your software project
- Deployment of the analysis tool and assistance with the use
- Advice and support for TIOBE TiCS Framework Deployment
- Advice and support for code restructuring