

/trends & hypes

Seals of approval for software: a trend or hype?

>>validation needed in addition to verification

Anyone who commissions the development of software expects to receive a functional system. However, once delivered, how can you tell whether or not a system is of the required quality? A seal of approval can provide assurance in this situation. How exactly is software developed and what does a software seal of approval verify?

Nowadays, development and production of custom-made software is being increasingly outsourced. These are often major projects, involving complex systems for the banking sector, hospitals, traffic management etc. Once a concrete investment has been made and the end product delivered, the client needs to know that the software functions properly. The system will then undergo many years of use and maintenance. Eventually, new wishes and requirements may arise, necessitating the addition of extra functions. If the software has been properly developed, then it is a relatively simple task to add extra functions. In order to do this, the code must be clear, unambiguous and well-structured, not just to the writer of the code, but also to the other developers. To illustrate the point, if a house is well built, you should be able to add an extra wall to one of the rooms without the entire house collapsing!

Tools

The maintainability of the software is largely determined by the style and structure of the software. Separate functions must be recognisable and easily adjustable without influencing any other functions. Fortunately, there are tools that help to write clear code. In the same way that grammar and style guides provide guidelines for language, rules and agreements provide guidelines for compiling code. These rules and agreements have been worked into special code-analysis programs such as Klockwork and Lint. These tools monitor the code for typical pitfalls: "I understand what the code has to do. You have made a cupboard with 10 shelves but you are trying to put something on shelf 11. Something is wrong, and you need to do something about it."

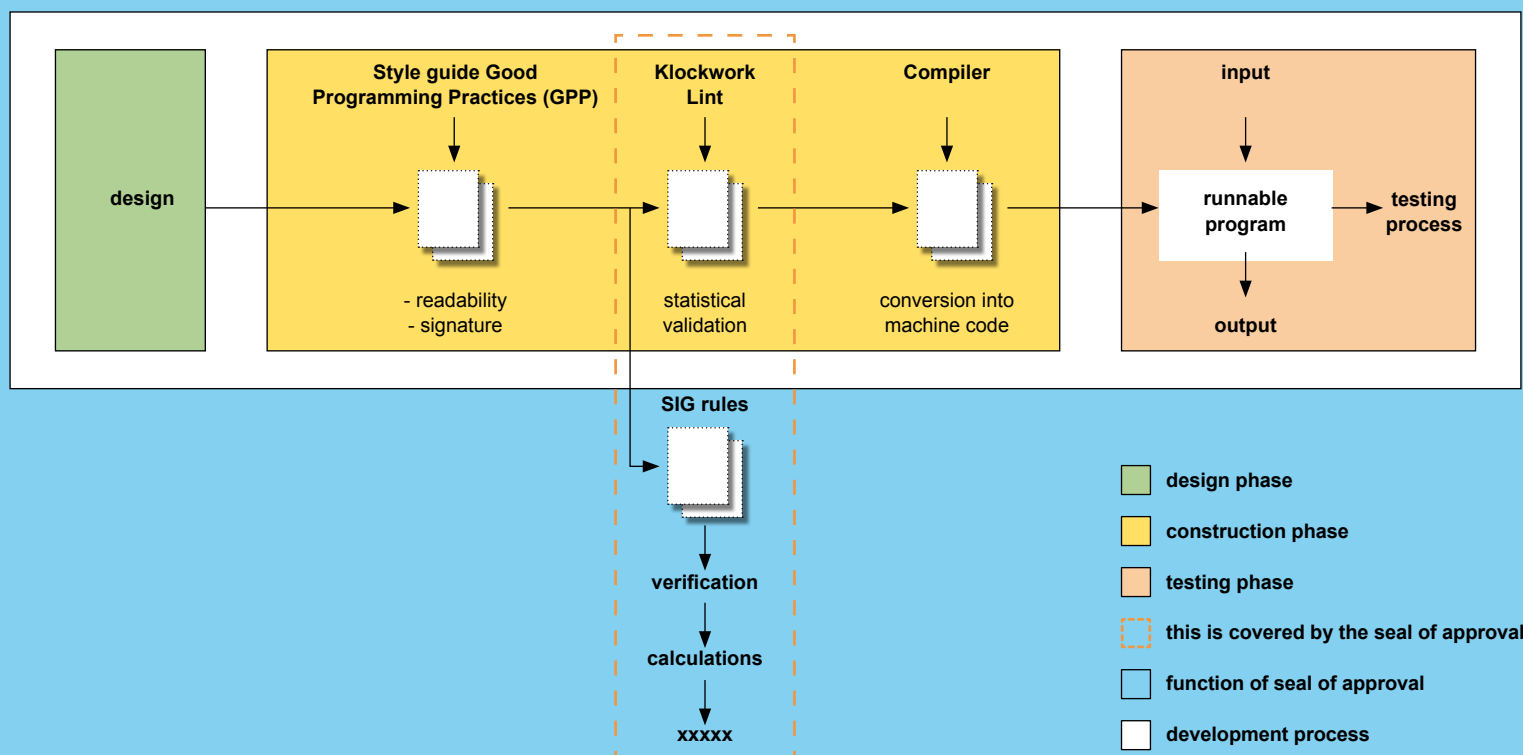
Style and complexity

Other aspects that these code analysers monitor include the style and the size of the modules. To a computer, it doesn't matter what the code looks like as long as everything works properly. However, good developers ensure that their codes are well structured. In order to do this, rules and style guidelines (summarised in Good Programming Practices) have been developed. For example, all code that is functionally linked belongs in the same module. This defines functions that are accessible from the main program. If a function becomes too large, then you need to split it into separate sub functions. The more complex the code, the greater the chance of errors. Analysis can be performed to count the number of decisions ('if x, then y') for each function and issue a warning if there are too many. The compilation of the code is also a form of analysis. The compiler will only convert the code into machine code if it has been written in compliance with the rules of the programming language used. Once it reaches this stage software is now ready to use, and the functional tests can begin in order to determine whether or not the program works properly.

Independent seal of approval

Once the client knows that everything works, the more difficult task of establishing the quality of the software begins. Will the code be easy to maintain and adjust at a later stage? It is for exactly this reason that the Software Improvement Group (SIG) was established. This certification institute gives an independent assessment regarding the quality of software products in the form of a seal of approval compliant with the ISO/IEC 9126 standard.





During the assessment, the SIG investigates the quality of the design and the process followed during development. The analysis investigates matters such as whether or not the functionality is divided into understandable modules and how the developer arrived at his/her design. In addition, interviews are held with system experts and the architects and designers of the code in order to gather information about their thought processes during development, the structure of the design, the objectives of the system, how these objectives have been achieved and how the designer tests his/her own design. This information is used during examination of the code in order to evaluate whether or not these thought processes and decisions are recognisable in the end result.

The value of the software seal of approval is that it translates a complex code into a simple guarantee of quality. A large system can consist of a thousand different modules which all make up one single software product. These modules are all subjected to dozens of tests, creating an impenetrable jumble of documentation. SIG translates this cacophony of information into a score of one to five stars, accompanied sometimes by advice for possible improvements.

Good code = flexibility

Maintenance is often the most expensive aspect of a system, although it is often overlooked when the development is outsourced. The ease with which adjustments can be made at a later date is determined by the maintainability of the system. It is far

more difficult to implement changes when the code is complex and has a low level of maintainability. After each adjustment, a great deal of testing is required to check that no other functions have been affected by the changes. The more maintainable the code, the quicker a developer can locate the correct module and implement a change by adding a compact section of code.

Expertise

Software seals of approval are a trend that offers a monitoring tool for the outsourcing of complex software systems. The client's key task is to provide a solution and to indicate the functional requirements with which the solution must comply. The technological side of the solution is not recorded in detail, but a number of criteria are fixed with regard to maintainability and expandability. A software seal of approval enables you to test these aspects. Our clients are currently testing out these seals of approval for themselves, with many of them possessing multiple Technolution systems assessed by the SIG during development. Despite being unfamiliar with the assessment method used by SIG, Technolution were still awarded high scores.

The seal of approval ultimately verifies whether or not the code is neatly structured. However, it does not verify that the system complies with the requirements. To do this, you still require the services of experts who monitor progress by means of a solid development strategy and numerous interim tests.