

# KBSE Tool for Megaprogramming

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Research in Knowledge Based Software Engineering (KBSE)—the area of building intelligent systems that can automate the construction of software—has been intensified in the last ten years, and is now addressing a full range of software engineering activities [Johnson 1993], trying to improve the quality and reduce the cost of software development.

Megaprogramming [Boehm 1992], the practice of software construction in a component-oriented fashion heavily based on software components reuse, has already been recognized as an important solution for the software crisis [Radice 1988]. It is a powerful means of not only reducing software development costs in the long run, but also increasing software correctness and reliability among other main software quality factors. Thus, megaprogramming is a very strong candidate for KBSE tool support.

One of the major elements that determine the success of an environment using megaprogramming is the actual reuse of available software components. This involves the software engineer determining the need of a component which is already available, effectively selecting the component that does actually fulfill his/her need, and appropriately using it.

When the software engineer actually gets to the point of selecting software components to fulfill his/her needs, he/she has already decided on the data structure to use, and may have already even started to do his/her program based on such a data structure. It may so happen that the particular data structure being used does not have very good implementations of all the components being required, and that if the user had selected a different data structure the options available would be extremely better for him/her.

Thus, a KBSE tool developed to address this software construction approach should be able to assist the software engineer in selecting the available software components that fulfill his/her needs, after having decided on the data structure, as well as in selecting the optimum data structure to use based on his/her foreseen needs.

During the spring term of 1993, we have developed a prototype to address both of the above desired tool functionalities. This prototype does not only consider the users' functional needs but also some quality ones, such as desired correctness level, available memory space, and expected execution time. The actual components' interleaving order was also recognized as a key factor involved in the selection process.

This presentation discusses the issues that need to be addressed by this kind of KBSE supporting tool, an explanation on our approach to the subject, including its limitations, and suggestions on some future research topics.

## References

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