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Wasserman, A.I., Gutz, S.; The Future of Programming; CACM 25, 3 (March 1982) pp. 196-205.

This paper takes the current trends in programming and based on these tries to forecast the development of programming in the short term (from 1982 to 1987), the medium term (from the middle 1980's through the end of the century), and the long term (the early part of the 21st century).

The Short Term

In the short term, the authors see efforts to increase programmer effectiveness and productivity by: the development of software tools that will support software development methodologies and the software development life cycle, the elimination of present day problems with software tools such as lack of compatibility, lack of uniformity, and lack of tailorability, the integration of these tools into development environments, more integration of software tools and high level languages, for example the development of debugging tools that are tied to the source code of a program rather than its object code, the development of still higher level languages, especially for the application programming areas, and the development of tools that allow fast building and modification of system prototypes.

The Medium Term

For this time period, the authors forecast more significant changes that will involve a greater automation of the program/system development process.

The nature of software will change from the current customized type that, in most organizations, is supported by specialized staff and that runs on large or medium sized computers to cheap "of the rack" software bought from software manufacturers to run on small (personal sized) computers.

Well specified, well documented, high quality software components will be available to the software implementor whose job it will then be to design the structure of the system and the interconnections of the various components to produce the system.

The software tools developed in the short term will be combined with hardware to form an integrated environment for a software developer to work via a personal machine that provides maximum support for software development.

High level languages based on ideas of programming methodology will increasingly gain acceptance. Languages approximating natural language will be used more widely in certain areas such as data base queries.

The Long Term

The authors base their prediction here on the foreseeable advances in the short and medium term and admit to the high speculative nature of the forecast for this term.

User programming will become very common. The authors see today's data base query languages as forerunners for various kinds of sophisticated tools that will allow the end user to carry out common (programming) tasks directly.

Programmers will be able to create programs by giving specifications of program functions and outputs. Specifications will be given by either some form of languages that are the "descendants" of today's formal specification languages, or by sets of decision rules that would be similar to ones used now in rule based knowledge systems.

In conclusion, this paper presents one possible view of the future of programming. It is interesting to note that some of the forecast changes in the medium term, such as the switch from large mainframes to personal computers and workstations, seem to some extent, to be already happening.

The predictions presented here all seem reasonable and achievable, although they may be on the conservative side, especially in the long term.