

POSTSCRIPT

As a conclusion to many pages of formal material, we should like to offer some personal comment on what has been achieved and what remains to be done. VDM is one development method and it is clear that others exist and will be created. But, in our opinion, systematic development methods have been shown to be useful. Our aim is to be able to tackle the development of large computer systems with a disciplined engineering approach. For many classes of problems this is now possible and this book illustrates how specifications and design can be recorded systematically. There is no suggestion here that the creative aspects of design are being mechanized: it is the ability to record and justify designs which is being proposed. It is the availability of a generally recognized notation which will enable computer scientists to record their knowledge in a way which will be used by others.

A further advantage of an agreed semantic definition method should come in teaching. The approach taken in chapter 4 to an analysis of language concepts and in chapter 12 to database concepts indicates how we believe such material should be taught. Teachers can only focus on concepts if some form of model is discussed. It should be clear that the underlying concepts are far more basic than the detailed syntactic issues which are so often allowed to obscure them.

VDM has here been applied to a number of applications and is being applied by people in industry to a wide range of problems. What are the limitations (and thus the research challenges)? The problems involved with parallelism have been completely ignored in this book. Our research in this area is reported in [Bjørner 80f, Jones 81a] and our colleague of the IBM Vienna Laboratory, Hans Bekić is actually working on this topic. Our reasons for not discussing parallelism in this book are not a lack of ideas but rather the plethora of proposals for basically different approaches to this important topic. Clearly this is an area for experiments and research.

Another area where research is necessary is the decomposition of specifications. Here, the current book should provide a valuable source of

problems. How, for instance could the common parts of the ALGOL 60 and Pascal definitions be factored out so that the commonality and differences are more apparent? Research in this area has been undertaken in the framework of "Z" [Abrial 80*] and "CLEAR" [Burstall 77a]; specific proposals relating to languages are being made by Peter Mosses ([Mosses 77a, Mosses 81a]).

A very pressing need is for the development of a support system which aids the control and modification of large definitions and designs. At its simplest, such a support system is a state-of-the-art undertaking. There is, however, ample scope for research projects aimed at mechanizing aspects of checking uses of VDM.