FORMALISATION OF DATA BASE MODELS AND DATA BASE MANAGEMENT SYSTEMS

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Abstract

The speaker has long been dissatisfied with his (in-)ability to ascertain quickly - from the reading of professional papers and textbooks on the subject - what data base models and data base management systems were all about. He is, in particular, quite alarmed over the manner in which the above kind of publications present the structural complexities of hierarchical and network data base systems.

In order to conquer this complexity, to understand the crucial concepts and to test a general software development method, he has therefore applied the abstract modelling techniques of denotational semantics in the style in which it evolved at the IBM Vienna Laboratory.

In two lectures, the results of such a semantic analysis of both the Bachman Data Structure Diagrams, as they evolve into basic parts of the CODASYL/DBTG network model and the hierarchical model underlying, for example IMS, are presented. The focus is on the representational abstraction of the underlying semantic (object) domains. From these architectural definitions the formal, but not mechanical, derivation of the corresponding data base management systems is then shown.

It is, of course, suggested that software engineering techniques, like the ones dealt with here, should be used as a tool in teaching, as well as actually developing, data base models and management systems. The lectures will therefore conclude with some observations on how this is pursued in the speaker's department.