PROGRESS IN SIMULATION LANGUAGE STANDARDS

An Activity Report for Technical Committee TC3 on Simulation Software 1979-82

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Historical Background

The only generally accepted standard for simulation languages is the SCi Continuous System Simulation Language (CSSL)(1), for which the specification was published as long ago as 1967. There is no accepted standard for discrete-event or combined continuous-discrete languages. It is therefore hardly surprising that in the 1970s a number of groups were established with the aim of modernising the CSSL standard and of developing standards for discrete or discrete-continuous languages. IMACS established Technical Committee TC3 on Simulation Software in 1975 and the Society for Computer Simulation (SCS - formerly SCi) set up a new Technical Committee on CSSLs. These two Committees have some common membership and have worked closely together. From an early stage TC3 established the practice of producing and circulating a regular Newsletter. In 1979, following an International Workshop held immediately before the 1979 IMACS Congress in Sorrento, a further Committee was formed called the Committee for International Standardisation of Model-Oriented Languages (CISMOL). The members of this Committee set themselves the task of examining modelling methodologies and fundamental aspects of model-description languages. At the TC3 meetings held during the Sorrento Congress immediately following the Workshop it was decided that for the time being, the main priority of TC3 should be towards developing new standards for simulation languages, thus complementing the activities of CISMOL. This report describes the results of the Committee's efforts during the ensuing three years.

Committee Activity 1979-82

At the Sorrento meetings the Committee set itself a minor task and a major one. The minor task was to reorganise the way in which its membership is defined and its officers elected. (Membership has always been, and continues to be, open to anyone interested in participating.) The major task was to proceed as expeditiously as possible with the development of proposals for new standards for simulation languages. The Committee resolved to hold at least one formal meeting per year, associated if possible with a major simulation meeting. It was recognised that a great deal of the Committee's business would have to be carried out by correspondence through the medium of the Newsletter.

In order to stimulate Committee activity in pursuit of its major goal, the Chairman prepared a list of 24 "Propositions Regarding the Next Generation of Simulation Languages" which were circulated in Newsletter No 6 in March 1980. This produced an encouragingly large number of reactions from Committee members which proved very valuable during the preparation of the CSSL81 proposal referred to below.

The 1980 meeting of the Committee was held in conjunction with the Simulation 80 meeting in Interlaken in June 1980. The main topic of discussion was the first of the 24 Propositions, that "the next generation of simulation languages must combine full continuous and discrete language features". This provoked a lively discussion with strong arguments advanced on both sides. Those in favour pointed out the increasing importance of combined continuous-discrete modelling and to the fact that languages have already been designed to meet this requirement. The contrary arguments were that establishing a new continuous standard was itself a major task on which progress so far has been very slow, and that there was still no general agreement on standards for discrete languages, or on a single "world-view" for discrete modelling. Dick Nance made a valuable contribution in the form of a discussion document which was subsequently published in Newsletter No 8 (March 1981) outlining his ideas of several levels of conformity between different simulation programming languages. The aims of this approach are to encourage recognition of the similarities between different types of simulation language and the development of a framework within which combined languages can be designed, whilst at the same time avoiding imposing unnecessary restrictions on standardisation efforts in the continuous area.

At this stage, the Chairman and his colleagues at Salford University produced an "Outline Proposal for a New Standard for Continuous-System Simulation Languages (CSSL81)" which appeared in Newsletter No 9

(May 1981). This proposal was discussed at the next Annual Meeting of TC3, held in May 1981 at the UK Simulation Council Conference on Computer Simulation in Harrogate, England. The proposal does not present a complete specification but rather an outline aimed at stimulating discussion. The main features of the proposal are the use of a style and constructs based on the approach of Ada and Pascal, separate program units to define model and experiment, a submodel feature, parallel segments and advanced discontinuity features. Many comments and suggestions have been received following circulation of the proposal to TC3 members and many of these were reported in Newsletter No 10 (September 1981). At the time of writing this activity report, an initial response by the Salford CSSL Group to these comments is due to be published in Newsletter No 11 in April 1982. This will be followed by a revised proposal in Newsletter No 12 which it is hoped will have been circulated in advance of this Congress.

TC3 is a large Committee with a membership list of approximately 70. It should be emphasised that this is an active membership, since the qualification for remaining a member demands regular input to the Committee's work. The Officers of TC3 who have prepared this report wish to express their sincere thanks to their Committee colleagues for helping to make their job so productive and rewarding.

Reference

(1) The SCi Continuous System Simulation Language (CSSL) Simulation Vol 9 No 6 December 1967.