6. Conclusions

Before considering any further developments to the programming system a survey was made of inventory control programs available from computer manufacturers and other sources. (See Urwick Diebold Technical Document ICS 6 (1966).) The objective of the survey was to put our own work into some sort of perspective and to assist in deciding on the areas, if any, in which we should develop our system.

It was clear from the survey that compared with manufacturers' approaches, we were aiming more at the feasibility, preliminary design, and justification stages than at the implementation stages. This was compatible with our original thinking on the sort of system we should design. We were primarily interested in developments which would not duplicate available work, as we were free to use or recommend other systems where appropriate. The conclusions of the survey were as follows:

1. The Urwick Diebold system is the most satisfactory system available for feasibility and justification studies, *when these are to be carried out by Urwick Diebold staff*, irrespective of whether the client has his own computer for which there may be inventory control programs available.
2. The system is also suitable for the implementation of operational inventory control systems using Atlas, and in assisting the specification and testing of operational systems for other computers.
3. Before implementing a system using a computer other than Atlas, the programs available from the manufacturer should be investigated to see if they are suitable for the proposed system.

In the design and development of the programming system we were also interested in gaining information on the feasibility of the approach and the time and cost involved in the production of such systems. We are interested in extending the approach to other problem areas and consider that we have gained useful experience from the present exercise, both in the design and implementation of a programming system and in the methods of using it. Perhaps our most significant conclusion is that "local" programming systems, based on the use of a high-level language to implement them, are possible within fairly modest time and cost budgets.

7. Acknowledgements

The early development of the programming system and the operational approaches was greatly eased by clients who understood the problems and contributed to their solutions. We thank them for their help.

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8. References

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Book Review

A Short Introduction to Numerical Analysis, by M. V. Wilkes, 1966; 76 pages. (London: *Cambridge University Press*, 25s. also available as a paperback)

In contrast with the situation only a few years ago, there are now available quite a number of introductory texts on numerical analysis written specifically for mathematicians, scientists and engineering students in universities and technical colleges. Unfortunately, several of these give the impression that numerical analysis is a form of drudgery requiring a peculiar type of mind which derives pleasure from grinding away for hours at desk calculators and similar paraphernalia, and seem designed to put the student off numerical analysis for life.

This latest addition to the list creates precisely the opposite impression, and it is good to see Professor Wilkes expounding at this elementary level. The result is a stimulating account of the rudiments of the subject, compressed into a few pages yet without the appearance of hurry or over-condensation, and which takes the reader gently along with the minimum of difficult mathematics yet without sacrifice of essential rigour. This has been achieved by limiting the contents to brief chapters on iteration, interpolation, numerical integration and differentiation, first-order differential equations, two-point boundary problems and linear algebraic equations. The level of mathematics assumed is a knowledge of calculus including partial differentiation, a little matrix algebra and, in one place (the development of Gaussian quadrature formulae), a familiarity with the orthogonality property of Legendre polynomials. Symbolic operator methods are used freely, and in one or two places, where this freedom might otherwise be deemed to border on excess, alternative treatments by direct application to polynomials are given.

There seems every chance that the hope expressed in the preface that the book will prove useful to a wide public will be amply realized. It is excellent stuff for the aspiring scientist and technologist; for the serious student of numerical analysis it is a must (along with Hildebrand and *Modern Computing Methods*, as the author recommends) and it should be compulsory reading for all service lecturers in mathematics, who could do no better than to base their courses on it.

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