MARCH 1967

The Maintainability Factor in System Design (p. 1) “We have been searching for those facets of the physical system implementation which will have the greatest effect on improved system maintenance and the least effect on classical system design factors such as cost, size, speed, etc. Two appear to be dominant. One is the inclusion of a read-only memory (ROM); the other is the use of a molecule (major board) as large as possible given other non-maintainability considerations. [For the ROM:] The regularity of structure and simplicity of construction, coupled with the minimal mutual interaction of its ancillary active components [i.e., drivers and sense amplifiers], make the memory particularly easy to check, test, and diagnose with a minimum of additional diagnostic hardware. [For the major board:] Once replaced with an appropriate spare, the faulty element is diagnosed offline on a special-purpose, computer-controlled device.”

Chairman’s Letter (p. 2) “The 31 December 1966 membership count for the Computer Group showed 9,701 members in grades other than students; 1,203 students (at the discounted rate of $1); 232 students at the regular rate; and 89 affiliates for a grand total of 11,225. This is the first penetration of the 11,000 level by any Group. Congratulations!”

Criteria for Assessing the Reliability of Total Computer Systems (p. 9) “To achieve a minimum overall cost-of-ownership, studies of many indices of utility and cost must be performed. Calculated tradeoffs such as original cost, spares and logistics costs, maintenance costs, consequences and costs of downtime, maintainability, and reliability figures-of-merit, etc., must be made to achieve the optimum balance between utility and cost.”

1967 McDowell Award to J.W. Backus (p. 11) “John W. Backus, IBM Fellow, has been named as recipient of the 1967 W.W. McDowell Award of the IEEE Computer Group, it was announced by the Computer Group Awards Committee. The award, the second in an annual series, will be presented to Mr. Backus at the Spring Joint Computer Conference.”

A Workshop on Multiprogramming (p. 12) “One question alone—How much of the implementation is by hardware and how much is by software?—appears to have as many answers as there were people present. ... The only agreement reached on the problem of resource allocation is that the problem is difficult and warrants much further study.” [Editor’s note: It’s interesting to note that a debate occurring 50 years ago about the balance among hardware, firmware, and software support for multiprogramming is still going on today regarding multicore, multithread programming.]

MARCH 1992


Computer Society Message (p. 4) “The society has over 100,000 members. It is the largest society of computer professionals in the world, and by far the largest constituent society within the IEEE.” [Editor’s note: The Computer Society had 32 technical committees in 1992. This fact, together with the membership numbers in the 1967 Chairman’s Letter, shows that the Computer Society has maintained its position in the world of computer professionals.]

The Usability Engineering Lifecycle (p. 12) “The model presented here is a modified and extended version of Gould and Lewis’ ‘golden rules’: early focus on users, user participation in the design, coordination of the different parts of the user interface, [and] empirical user testing and iterative revision of designs based on the test results. ... Usability heuristics [include] use simple and natural dialogue; speak the user’s language; minimize user memory load; be consistent; provide feedback; provide clearly marked exits; provide shortcuts; provide good error messages; [and] prevent
errors. ... The top six methods according to rated impact on usability are (1–2) iterative design and task analysis of the user’s current task, (3) empirical testing with real users as subjects, (4) participatory design, [and] (5–6) visit to customer location before start of design and field study visits to customers.”

**SoundWorks: An Object-Oriented Distributed System for Digital Sound** (p. 25) “The field of computer-based music encompasses issues in music composition, synthesis, manipulation, and performance. Here we address the manipulation and synthesis of sounds. Our primary goal in this work was to provide standard sound manipulation (or editing) features like splicing, looping, and mixing.”

**Mediators in the Architecture of Future Information Systems** (p. 44) “A mediator is a software module that exploits encoded knowledge about certain sets or subsets of data [for example, from databases] to create information for a higher layer of applications [for example, decision making]. We place the same requirements on a mediation module that we place on any software module: It should be small and simple so that it can be maintained by one expert or, at most, by a small and coherent group of experts.”

**Taxonomy and Current Issues in Multidatabase Systems** (p. 50) “Multidatabases are an important area of current research, as evidenced by the number of projects in both academia and industry. The trade press has also documented the need for user-friendly global information sharing. The next level of computerization will be distributed global systems that can share information from all participating sites. Multidatabases are a key component of this advancing technology. ... [Classes within the] taxonomy of global information-sharing systems are distributed database, global schema multidatabase, federated database, multidatabase language system, homogeneous multidatabase language system, and interoperable systems.”

**The Stanford DASH Multiprocessor** (p. 63) “Directory-based cache coherence gives DASH the ease-of-use of shared-memory architectures while maintaining the scalability of message-passing machines.” [Editor’s note: Stanford DASH was the first operational machine to include scalable cache coherence.]

**Boehm Outlines DoD Software Technology Strategy** (p. 103) “[Barry] Boehm said this goal means that a typical system or upgrade started in the year 2000 would cost half as much as the same capability would cost using 1992 technology and practices. As director of the Software and Intelligent Systems Technology Office of the Defense Advanced Research Projects Agency, Boehm had a large part in drafting the 400-page Software Technology Strategy report on which he based his speech.”

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Phone: +1 202 371 0101 • Fax: +1 202 728 9644
Email: hg.ofc@computer.org
Los Alamitos: 10862 Los Vaqueros Circle, Los Alamitos, CA 90720
Phone: +1 714 821 8830 • Email: help@computer.org
Membership & Publication Orders
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