

Preface

This issue contains eight contributions on a variety of subjects: usability, real-time and multi-database systems, air traffic control, intelligent agents, concurrency and group support in object-oriented systems development, and distributed systems.

The first paper, by DiAngelo and Petrun, describes and demonstrates a method for obtaining usability requirements for product development. The methodology was developed and used over the last six years, and some summary results from that experience are shown. This work is intended to augment the currently available methods for gathering functional requirements by addressing usability and user requirements explicitly.

The framework for information systems architecture developed by John Zachman is extended to more specifically address the creation of real-time systems, as described by Schoch and Laplante. The authors add to Zachman's architecture through inclusion of real-time systems concerns such as multitasking, temporal behavior, inter-task communication and synchronization, object code efficiency and performance, and system verification. They also describe the effect this approach has on real-time systems development and draw conclusions about existing tools and trends.

In a previous issue of the *Journal*, two papers introduced the CORDS project—COnsortium for Research on Distributed Systems. Here, Attaluri et al. continue that discussion with a description of the CORDS multidatabase project, which is focused on data access that is independent of where the data are stored and how they are managed. The paper presents an architecture derived to support such data access, treating subjects such

as catalogs, query optimization, and transaction management.

Debelack et al. provide a look into the future of systems for the automation of air traffic control. They describe the evolution of the current environment, the rationale for the systems being built today, the architecture for those systems and its current implementation, and the provisions for adaptation, support, and testing. The extremely stringent requirements for safety and flawless, continuous operation create significant challenges for software development and its underlying technologies.

The next paper describes a class of knowledge-intensive problems that have been overlooked but are now amenable to systematic solution. That class—episodic classification problems—includes problems where the need for support is transitory and experts are not readily available. The author, Elofson, presents a system for addressing these problems and results from use of the system. The author's approach relies on the use of intelligent agents acting as apprentices for experts.

The combination of object-oriented technologies and the methods of group-oriented software development is the subject of a paper by Hayne and Pendergast. The authors present their practical experiences with providing such group work environments, which are made possible by the use of multitasking operating systems. They describe the object-oriented paradigm as being uniquely suited for processor communications, data sharing, coordination of user views, and cursor positioning.

Arjomandi et al. provide a new approach for the implementation of currency in C++, utilizing

only its existing capabilities. In their prototype, active objects are used for the synchronization required for concurrent programming. Without modification or preprocessing, the C++ compiler is shown to be powerful enough to support the functionality required. The paper includes a discussion and comparison of some other implementations of concurrency in C++.

The final contribution, by Colosimo, appears in the Technical Forum. The author briefly describes the importance of IBM's Open Blueprint for the future of distributed and client/server systems that operate in multivendor, heterogeneous network environments. The Open Blueprint builds on industry standards to create a view of the network as a single system. The discussion includes the business environment, the Open Blueprint itself, its background, and related standards.

As the *Journal* begins its 34th year, we would like to acknowledge the support of readers, authors, and referees that makes such a long history possible. We thank you and encourage you to continue your interest and participation in this publication. We point out that in 1994 the authors represented the United States (51 percent) and other countries (49 percent), and IBM (57 percent) and other sources (43 percent). It also seems appropriate at such a time to state a few facts that sometimes escape us as we focus on a single paper, theme, or special issue. First, this publication is a quarterly refereed technical journal, which means that the integrity of each paper is ensured by a process that depends upon peer reviews of content, currency, and value by recognized experts within and outside IBM. Second, it is intended for the software and systems professional and applied research community worldwide. The papers are written for a technically aware readership, and we welcome submissions by knowledgeable authors around the globe, within and outside IBM. Third, the *Journal* has about 65 000 subscribers worldwide. Of those, approximately two-thirds are technical professionals and researchers outside IBM; one-third are IBM employees; two-thirds are in the United States; and one-third are in other countries.

We extend a special welcome to new subscribers who receive the *Journal* through their membership in the ACM. Other ACM members who wish to

take advantage of this subscription program can find helpful information on the inside back cover.

There has been a change that will benefit those who wish to make copies of the *Journal's* copyrighted material. We have joined the Copyright Clearance Center and their code now appears at the bottom of the first page of each paper and copyrighted section. See the Table of Contents for instructions.

The next issue of the *Journal* will be a special issue on systems for highly parallel processing.

Gene F. Hoffnagle
Editor

Announcement

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For recent issues—
Table of contents
Preface
Abstracts
Cover image and description
Subscription information
Reprint ordering information
Author guidelines