Information Technology—Best Practices in Design and Development

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Introduction

In the foreword to this issue of the *AT&T Technical Journal*, Dan Stanzione reiterates the need for sharing best practices across the company, especially in the area of software development. Software is the key integrating element in information technology (IT). Although definitions abound, IT is used here to describe the set of technologies employed in the design, development, and deployment of information systems.

Both this issue of the *AT&T Technical Journal* and the next explore the many facets of IT. This issue focuses on best practices in design and development, and the following issue will highlight reuse technologies and their applications.

Design and Development

At first glance, the reader may expect the papers by Bernstein and Moreland et al. to describe very different practices, because the former is about the development of very large IT systems, and the latter about small ones. What may be surprising is how similar they are in their recommendations: reliance on strong project management and prototypes, excellent communications among team members, and close connections to the customer. Their similarities are due to the fact that best practices in software development can be applied to IT systems of virtually all domains and sizes.

A case study in software excellence is presented in the paper by Deutschen et al., who describe a New Age software organization, the Advanced Software Construction Center. The ASCC has consistently scored among the highest AT&T organizations using an internal software process assessment tool.[1] Indeed, its scores rank it leading edge among non-AT&T organizations as well. The success of the ASCC can be attributed to two major strategies: a complete alignment of processes to the organizational mission, and a human performance management infrastructure that supports this alignment.

Among the challenges faced by IT managers and identified by the assessments as needing improvement are project and people management. Within project management, *scoping*—that is, the quantification of risk and the estimation of project resources—requires significant attention. The Sulgrove paper addresses scoping, offering a useful set of templates for project managers. Once a project has been adequately scoped, project managers need to be aware of the people aspects of software development. Recently, the Software Engineering Institute at Carnegie-Mellon University issued the People Capability Maturity Model,* Release 1.[2] This model recognizes that improvement in performance requires organizations to focus on their processes for managing, developing, and utilizing their people. This model receives validation from Yochum et al., who discuss a holistic people management approach that is being applied to IT professionals at AT&T.

The final three papers continue the theme of best practices. During the proposal and design stage of an IT system, technical design tradeoffs are made to select an appropriate architecture. Belanger et al. describe a powerful technique for categorizing large telecommunications operations systems according to their architectural style. This novel approach, which results in less complex designs, also helps to identify common components across large systems. Johnson and Westwater discuss another aspect of good design: usability. Their experience on the AT&T Global Information Solutions automatic teller machines illustrates the importance of cognitive engineering. Finally, Eick and Fyock describe a new set of data visualization tools for helping to extract information from large volumes of data. The case studies in the paper herald a new class of

opportunities for gaining insights into how to better manage AT&T's business operations.

The papers in this issue barely scratch the surface of the richness in the design and development of best-in-class IT systems. They do, however, point to the need for radical and incremental change. The next issue of the *Journal* focuses on state-of-the-art reuse technologies and their application in IT systems, which help AT&T's products and services gain quicker entry into the marketplace.

*Trademark

Capability Maturity Modeling is a trademark of Carnegie-Mellon University.

References
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2. *The People Capability Maturity Model*, CMU/SEI-95-MM-02, Carnegie-Mellon University, Pittsburgh, Pennsylvania, September 1995.

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