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Organizational Change

Ann Miller, *University of Missouri–Rolla*

Walt Disney is credited with saying that “Change is inevitable; growth is optional.”

We certainly have witnessed significant change in the software industry in the last few years. Furthermore, even the rate of change seems to be increasing. Will the pace level off or will it continue accelerating? And as we change, are we growing? Certainly the size of software in products is increasing. A few years ago, a study of one product family indicated that its software content was expanding at more than 80 percent



per year; furthermore, this product line had been experiencing that growth rate for nearly two decades.¹ Are we growing proportionately in our knowledge of how to manage, develop, and maintain software?

Lead, manage, cope, or none of the above?

Organizational change is this issue's focus. In the software and information technology industry, organizational change has been a way of life. It is quite telling to listen to individuals discussing change in their organizations. Their words frame their philosophies: some plan and lead change, others manage it, still others accommodate change, and many simply try to cope with it. Then there is the euphemistic phrase "change control." I have always found this phrase particularly curious, especially since change control boards often don't control change effectively. In a major system development project, I recall a situa-

tion in which a two-tiered hierarchy of CCBs was established: one senior-level CCB and several second-tier boards, one for each major subsystem. The chair of the senior CCB dictated that only the proposed changes whose impact was estimated to cost \$1 million or more should reach this higher-level review and approval board. It was amazing how many proposed modifications were estimated to cost "only" half a million dollars. This dictate discouraged engineers from carefully considering and tracing the potential ramifications of their proposed changes. Furthermore, although representatives from other subsystem projects attended every meeting of the second-tier boards, they were not voting members. Thus, even if these codevelopers saw the potential for significant impact to their own subsystem from a change within a different subsystem, all they could do was voice that concern. To take the matter to the senior board, the affected subsystem group had to carry out its own study and demonstrate that the total cost of the proposed change would exceed the magic million-dollar mark. That project certainly did not control change effectively; on more than one occasion, senior management had to rescind an approved change after receiving a more detailed impact analysis.

Change is not only inevitable, it is everywhere. Organizational change occurs at many levels and across many dimensions. When I worked in industry, my colleagues and I often commented on the organizational chart du jour; some part of our large company was always undergoing change. But change occurs not just in management structures; it also occurs in products, processes, technology, tools, communication media—in virtually every aspect of an organization, down to its very core: its corporate culture and people. Change usually also involves some element of risk. Conversely, when a potential risk becomes a reality, some sort of change becomes necessary. Some people thrive in the energy and turmoil of change; others resist it mightily. Thus, the articles appearing here address social issues as well as technical ones.

The theme articles

Just as organizational change spans a wide spectrum, so too do the articles and features in this special focus. In the first article, Michael Deck addresses the importance of process diversity. In recent years, there has been a trend

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in companies to standardize the software development process; one supporting argument for this common process is that a software engineer from one project can easily move to a different project and be productive quickly in the new environment. However, many software engineers feel that one size does not fit all when it comes to development and test process. They frequently subvert or ignore a standard process because they feel it is too restrictive on a given project. "Managing Process Diversity While Improving Your Practices" addresses diversity management within an organization to tailor a standard process to meet specific project needs.

We continue with software process improvement in "SPI Patterns: Learning from Experience" by Marina Blanco, Pedro Gutiérrez, and Giuseppe Satriani, who discuss the European Software Institute's repository of over 250 process improvement experiments. The authors have analyzed the repository for patterns to help organizations plan improvement initiatives.

In the third article, "Mentoring Object-Oriented Projects," Ramkumar Ramaswamy discusses the value of on-the-job mentoring in learning process and design skills, particularly in object-oriented projects. People are always key to any process improvement, so methods to help staff ramp up on the learning curve of a technology or process are extremely important to the success of that technology or process adoption.

The fourth article explores the business aspects of organizational change. In "What Makes Measuring Software So Hard?" Stan Rifkin discusses the importance in having a software measurement program aligned with the organization's business goals and objectives.

When working on software, requirements inevitably change and grow; moreover, each of the key stakeholders—customer, end user, manager, developer—approach the same requirements from different perspectives. The final article, "Developing Groupware for Requirements Negotiation: Lessons Learned" by Barry Boehm, Paul Grünbacher, and Robert O. Briggs, presents a distributed groupware system called WinWin and discusses how it facilitates the requirements process.


In addition to the contributed articles, this issue features two interviews. The first is with Eric Schmidt, Novell's chief executive

officer. It is Novell's latest ad campaign that triggered the interview: The use of David Bowie's classic rock song, "Changes." Schmidt has been at the helm of Novell through a sea of change, and he shares some of his insights gained over that time.

When companies embark on a significant transformation, they frequently seek advice from consultants. Today, there is a new breed of consultants who prefer the title "coach." They stress dialog, not one-way communication; they stress collaboration and teamwork; and they deal specifically with change. Our second interview is with Mary Boone, president of Boone Associates. She is an executive coach and consultant who specializes in organizational communication and the strategic application of information technology.

To bring some insight and stability in a time of change, Albert Einstein's three rules of work offer good advice:

1. Out of clutter, find simplicity.
2. From discord, find harmony.
3. In the middle of difficulty lies opportunity.

There are those who argue that change is just the swing of the pendulum; so perhaps the words of another philosopher, John Mellencamp, are appropriate when he sings, "I know there's a balance—I see it when I swing past." 

Acknowledgments

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Reference

1. T. DeMarco and A. Miller, "Managing Large Software Projects," *IEEE Software*, vol. 13, no. 4, July 1996, pp. 24–27.

About the Author



Ann Miller is the Cynthia Tang Missouri Distinguished Professor of Computer Engineering at the University of Missouri-Rolla and is the *IEEE Software* associate editor for software management. She also serves on the NATO Information Systems Technology Panel and chairs the NATO Task Group on Validation, Verification, and Certification of Embedded Systems. She has over 12 years of software experience in industry and three years of senior executive service in the US Department of Defense. She has a BS, MS, and PhD in mathematics from St. Louis University. Contact her at millera@ece.umr.edu.