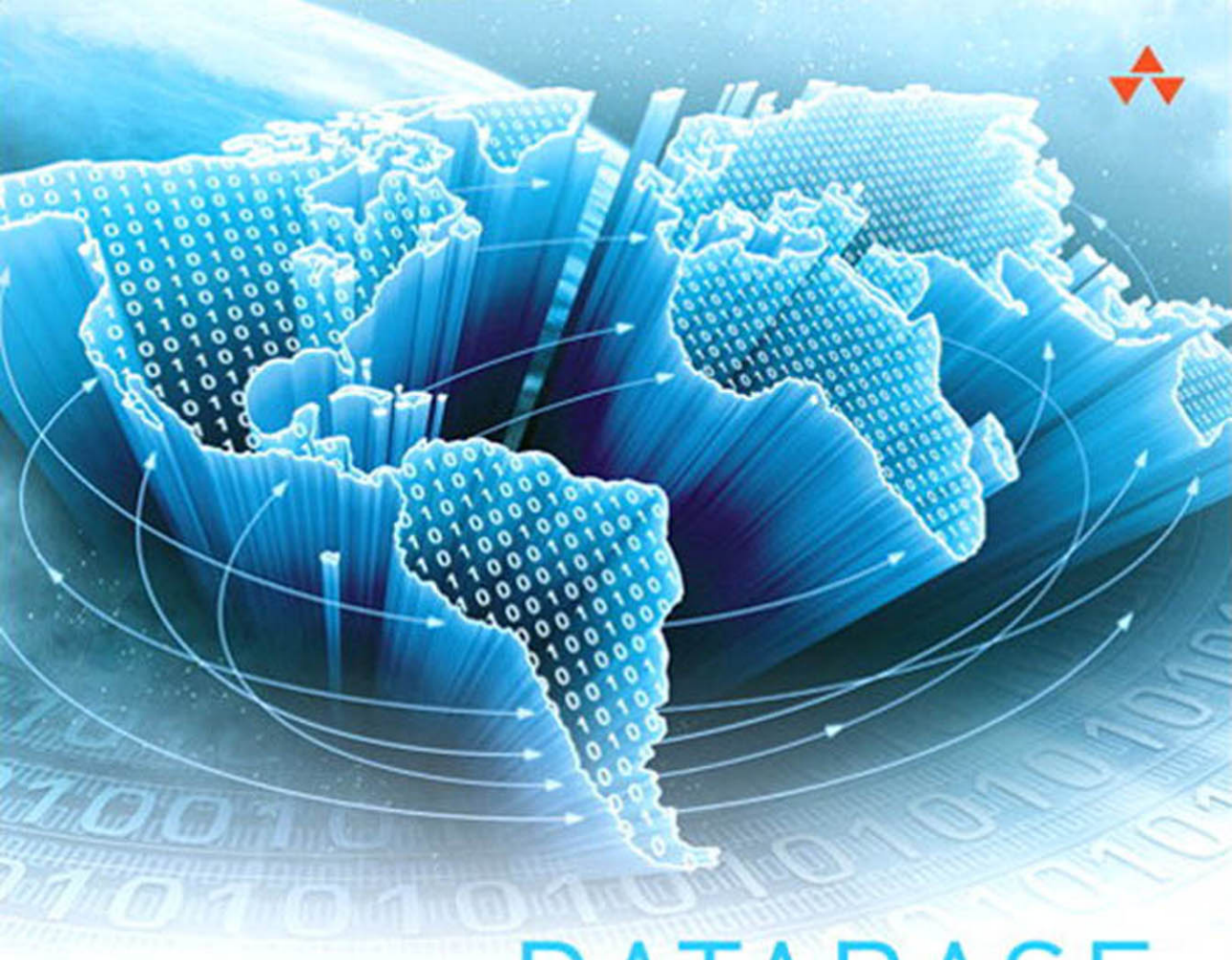

# DATABASE ADMINISTRATION

## The Complete Guide to DBA Practices and Procedures

**SECOND EDITION**

CRAIG S. MULLINS

## Accolades for *Database Administration*

"I've forgotten how many times I've recommended this book to people. It's well written, to the point, and covers the topics that you need to know to become an effective DBA."

—Scott Ambler, Thought Leader, Agile Data Method

"This is a well-written, well-organized guide to the practice of database administration. Unlike other books on general database theory or relational database theory, this book focuses more directly on the theory and reality of database administration as practiced by database professionals today, and does so without catering too much to any specific product implementation. As such, *Database Administration* is very well suited to anyone interested in surveying the job of a DBA or those in similar but more specific roles such as data modeler or database performance analyst."

—Sal Ricciardi, Program Manager, Microsoft

"One of Craig's hallmarks is his ability to write in a clear, easy-to-read fashion. The main purpose of any technical book is to transfer information from writer to reader, and Craig has done an excellent job. He wants the reader to learn—and it shows."

—Chris Foot, Manager, Remote DBA Experts and Oracle ACE

"A complete and comprehensive listing of tasks and responsibilities for DBAs, ranging from creating the database environment to data warehouse administration, and everything in between."

—Mike Tarrani, Computer Consultant

"I think every business manager and every IT manager should have a copy of this book."

—Dan Hotka, Independent Consultant and Oracle ACE

"This book by Craig Mullins is wonderfully insightful and truly important. Mullins describes the role and duties of data administrators and database administrators in modern organizations with remarkable insight and clarity."

—Michael Tozer, Author and former U.S. Navy officer

An additional result of each design review is a separate list of action items. This list should contain every modification or change discussed during the design review. Each action item should be given a deadline and be assigned to a single person, giving that person the responsibility to make the change, test its impact, and report the progress back to the entire group.

## Additional Considerations

There are additional considerations and issues that you will need to deal with as you prepare and conduct your database design reviews. You must be prepared to adapt to changing situations and personnel, as well as to the needs of your organization.

In this section two additional design review considerations are addressed. The first one is how to overcome a potential pitfall: working with a geographically dispersed staff. The second issue is more of an opportunity: using design reviews to mentor junior staff members.

### Dealing with Remote Staff

In some cases organizations have distributed workforces where DBAs and development staff are not located at the same site. When staff members are remote, the design review process becomes an even more critical piece of the development project because it forces communication between resources that are not able to interact on a daily basis.

Of course, a distributed staff also complicates the design review. Although it is possible to fly team members to a single location to participate in design reviews, it is rarely cost-effective. Instead of bringing every participant into the same room to conduct the review, a conference call, videoconference, or Web-enabled meeting (such as Live Meeting or WebEx) can be set up. In such cases it is important that materials be available well in advance of the meeting so that each participant can review the content beforehand.

At any rate, you cannot assume that every staff member who should attend the design review meeting will be located at the same site.

### Mentorship and Knowledge Transfer

Design reviews meetings can be a great opportunity for mentoring junior staff members. The meetings should be attended by senior technicians, many with teaching abilities. By inviting junior technicians (who are receptive to

new ideas) to the meeting, you potentially can transfer knowledge cost-effectively and efficiently.

Be sure, though, not to turn the meetings into purely education sessions. Furthermore, do not let the junior personnel derail the meeting with endless questions or let the senior personnel use the meeting as a soapbox.

The purpose of the design review is to ensure the viability of the new application and database for the organization. Usually it is possible to do a little mentorship at the same time.

## Summary

Design reviews can be time-consuming and difficult to manage, but they are worth the effort. If a systematic approach to database application design reviews is established and followed, the likelihood of implementing optimal applications increases. Database development can be very complex. Only by managing and documenting the implementation process can you ensure the creation of successful and useful application systems. The design review process is an efficient way to encourage a rigorous and systematic pre- and post-implementation review of database applications.

## Review

1. Name the roles required for each design review.
2. What are the differences between a logical design review and a physical design review?
3. During which type of design review should denormalization be discussed?
4. Why is it important to review application code in addition to reviewing SQL?
5. During which phase of the ADLC should the pre-implementation design review be conducted?
6. During which type of design review should the design be checked for conformance to third normal form?
7. Cite several reasons for including representatives from application development management in design reviews.

8. What output is required of every design review?
9. During which type of design review will the impact of the application on the computing resources of the company be ascertained and analyzed?
10. Why should the DBA lead most of the design reviews?

## Suggested Reading

DeMarco, Tom, and Timothy Lister. *Peopleware: Productive Projects and Teams*. New York, NY: Dorset House (1987). ISBN 0-932633-05-6.

Freedman, Daniel P., and Gerald M. Weinberg. *Handbook of Walkthroughs, Inspections, and Technical Reviews.* New York, NY: Dorset House (1990). ISBN 0-932633-19-6.

Ginac, Frank P. *Creating High Performance Software Development Teams.* Upper Saddle River, NJ: Prentice Hall (2000). ISBN 0-13-085083-7.

Rothstein, Michael F., and Burt Rosner. *The Professional's Guide to Database Systems Project Management.* New York, NY: John Wiley & Sons (1990). ISBN 0-471-62130-7.

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# Database Change Management

Change is the only constant in today's complex business environment.

Although a cliché, it is true that change is the only constant in today's complex business environment. An ever-changing market causes businesses to have to continually adapt. Businesses are striving to meet constantly changing customer expectations while trying to sustain revenue growth and profitability at the same time. To keep pace, businesses must constantly update and enhance products and services to meet and exceed the offerings of competitors.

Moreover, the individuals within the business usually find it difficult to deal with change. Change usually implies additional roles and responsibilities that almost inevitably make our jobs more difficult. Our comfortable little status quo no longer exists. So, we have to change, too—change either aspects of our environment or our approach to doing things. There are many different elements of managing change, particularly with respect to IT. Each of the following constitutes a different facet of the "change management" experience:

- The physical environment or workplace changes to accommodate more employees, fewer employees, or perhaps just different employees with new and different skill sets.

- The organization changes such that processes or methodology, for example, have to adapt to facilitate a quicker pace for product and service delivery.
- The network infrastructure changes to provide support for a growing, and perhaps geographically dispersed, workforce.
- Applications and systems change to perform different processes with existing data or to include more or different types of data.
- The type and structure of data change, requiring modifications to the underlying database schemata to accommodate the new data.

Many factors conspire to force us into changing our database structures.

Change is inevitable but necessary for business survival and success. Many factors conspire to force us into changing our database structures, including

- Changes to application programs that require additional or modified data elements
- Performance modifications and tweaks to make database applications run faster
- Regulatory changes that mandate storing new types of data, or the same data for longer periods of time
- Changes to business practices, requiring new types of data
- Technological changes that enable databases to store new types of data and more data than ever before

Change will never disappear. Therefore, it is imperative that we have solutions to enable us to better manage these inevitable changes.

## Change Management Requirements

To successfully implement effective change management, understanding a set of basic requirements is essential. To ensure success, the following factors need to be incorporated into your change management discipline: proactivity, intelligence, analyses (planning and impact), automation, standardization, reliability, predictability, and quick and efficient delivery.

- *Proactivity.* Proactive change, which can eliminate future problems, is an organization's most valuable type of change. The earlier in the development cycle that required changes are identified and implemented, the lower the overall cost of the change will be.
- *Intelligence.* When implementing a change, every aspect of the change needs to be examined, because it could result in an unanticipated cost to the company. The impact of each change must be examined and incorporated into the change process, because a simple change in one area may cause a complex change in another area. Intelligence in the change management process often requires a thorough analysis that includes an efficient and low-risk implementation plan. True intelligence also requires the development of a contingency plan, should the change or set of changes not perform as projected.

A well-planned change saves time.

- *Planning analysis.* Planning maximizes the effectiveness of change. A well-planned change saves time. It is always easier to do it right the first time than to do it again after the first change proves to be less than effective. An effective organization will have a thorough understanding of the impact of each change before allocating resources to implement the change.
- *Impact analysis.* Comprehensive impact and risk analyses allow the organization to examine the entire problem, and the risk involved, to determine the best course of action. A single change usually can be accomplished in many different ways. However, the impact of each change may be considerably different. Some changes involve more risks: failure, undue difficulty, need for additional changes, downtime, and so on. All considerations are important when determining the best approach to implementing change.
- *Automation.* With limited resources and a growing workload, automating the change process serves to reduce human error and to eliminate more menial tasks from overburdened staff.
- *Standardization of procedure.* Attrition, job promotions, and job changes require organizations to standardize processes to meet continued productivity levels. An organized and thoroughly documented approach to completing a task reduces the learning curve, as well as the training time.