

Implementing Database Development Best Practices for Oracle

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Technical Brief

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INTRODUCTION

Industry experts estimate that software bugs cost the worldwide economy billions of dollars (according to the National Institute of Standards and Technology, http://www.nist.gov/public_affairs/releases/n02-10.htm). These bugs pose tremendous financial burdens, due to the poor performance and logic errors they create. In addition, they decrease productivity, increase frustration, and make it difficult for companies to meet changing business requirements.

In an age of outsourcing and multi-skilled developers - whose focus may not be on database development - there is an increasing need for a process to ensure the delivery of optimal code to production.

Currently, organizations lack an automated process. Thus development teams, regardless of skill set, are inhibited from consistently producing the highest-quality code that also performs at optimal levels. Also, management has no way to effectively validate code before it's deployed into production.

By implementing development best practices, organizations can achieve these goals and ensure the quality of code produced by developers and development teams.

DATABASE DEVELOPMENT BEST PRACTICES METHODOLOGY

Quest Software offers a set of guiding principles to help organizations establish a methodology for best practices. Database development best practices for Oracle comprise the following three-step process that is automated by Quest's Toad® Development Suite for Oracle:

1. Develop – developers build code faster and cleaner, with fewer bugs
2. Optimize - developers and development teams write efficient SQL code the first time, every time, and avoid costly performance issues in production
3. Validate – the QA team tests SQL statements or PL/SQL in production-like conditions using scalability testing to validate that code will perform optimally in a production environment

Figure 1 illustrates the Toad Development Suite's best practices workflow. It begins with developers working in geographically dispersed teams, where development takes place. Next, automated code reviews are performed. Then, code is scanned and optimized. Lastly, the satisfactory code is passed to QA for validation of performance and scalability under production-like scenarios.

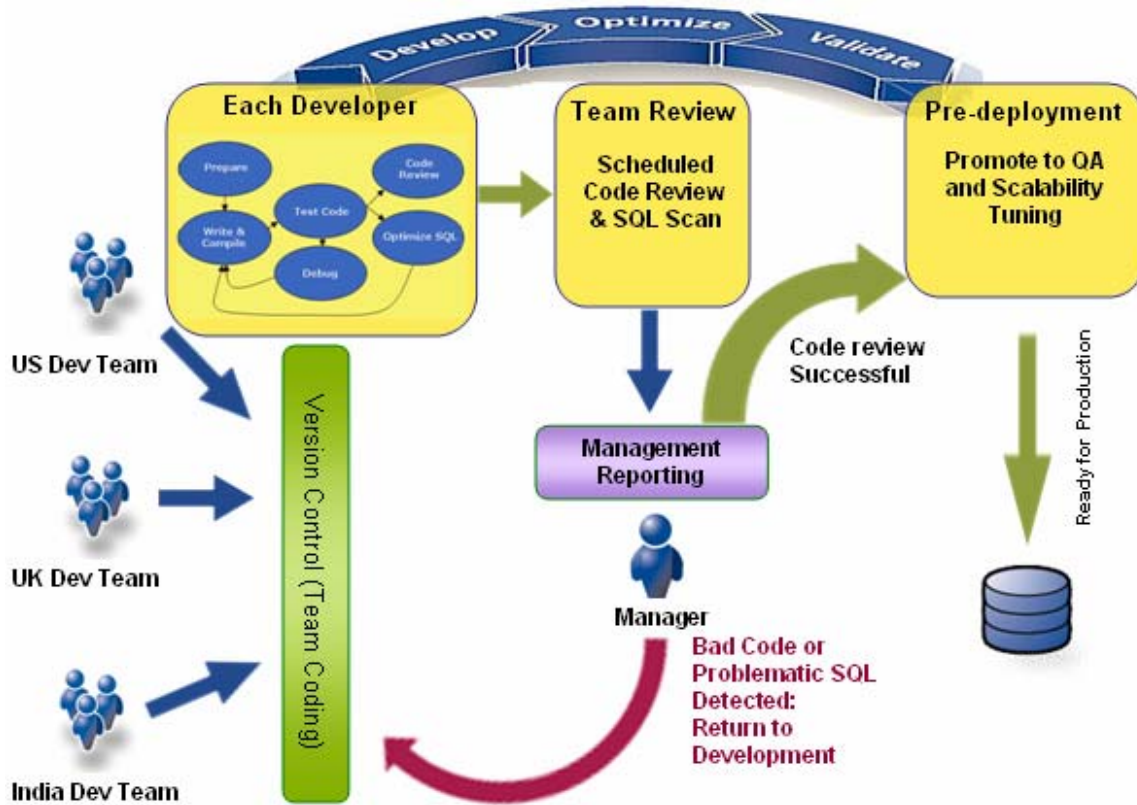


Figure 1. Development Best Practices Workflow

The following sections provide an overview of the single developer and project-wide methodologies.

Single Developer Methodology

Toad® for Oracle enables developers to easily:

- Prepare and define test cases - understand the database environment by sharing project assets across your team via the Toad Project Manager asset list. Next, view tables, code, and the relationships between them with Toad's Code Roadmap and ER Diagrammer. Finally, define test cases that verify the functional requirements with Quest Code Tester for Oracle.
- Write and compile – manage code integrity with transparent access to the version control system with Toad's Team Coding. Check code in or out using Toad's Editor or Project Manager, or collaborate and share code and templates between team members.
- Test code – validate that the code meets pre-set specifications by performing unit testing (a time-consuming process that is often

skipped). Quest Code Tester for Oracle is the only tool on the market that automates this PL/SQL testing process.

- Debug code – identify and fix specific lines of faulty code using Toad’s debugger. Toad’s debugger provides an intuitive environment from which developers can maintain and debug PL/SQL code as well as Java-stored procedures with conditional breakpoints and watches.
- Review code – examine code objectively for functionality and quality against pre-defined rule set, which can be saved on a network by project. Teams can easily apply the rule sets and ensure code consistency using through Toad’s Code Xpert. Scan source code with Code Xpert’s SQL Scanner to identify SQL statements that could cause problems in production.
- Optimize SQL – audit SQL performance with Toad’s SQL Optimizer, which automates the scanning of source code objects, files and SQL statements. It also rewrites and evaluates SQL alternatives to improve the execution times of the most critical SQL statements.

Figure 2 illustrates the single developer best practices workflow, which is based upon the teachings of Quest Software’s domain expert and the world’s leading PL/SQL expert, Steven Feuerstein. He is also the creator of Quest Code Tester for Oracle and influential in the development of Toad for Oracle’s Code Xpert.

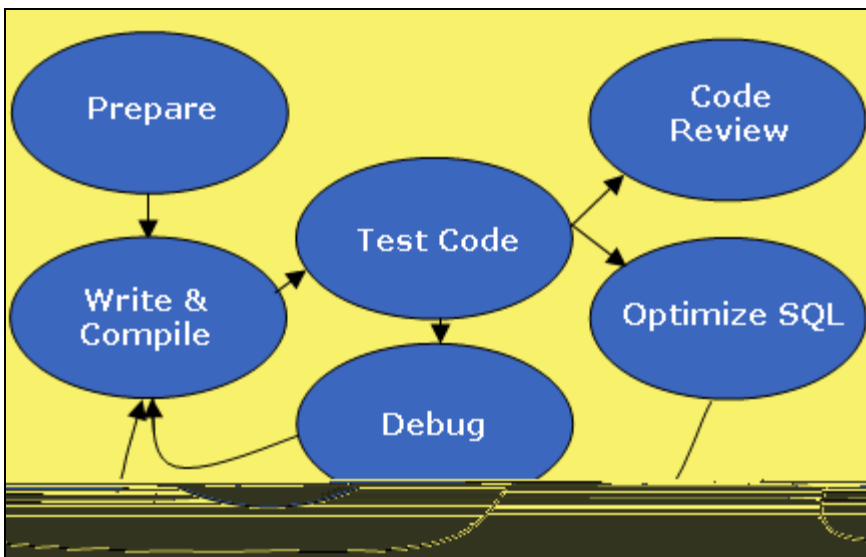


Figure 2. Single Developer Best Practices Workflow

Even with the help of Toad, it is very difficult for development managers and team leaders to successfully implement such best practices consistently

across development teams that may be geographically dispersed. The challenge is to ensure the best practices accomplish the following, while applications are in development:

- Effective sharing of information
- Objective code reviews with meaningful management reporting, detection and resolution of SQL performance problems
- Scalability testing of critical SQL and PL/SQL code

Project-Wide Methodology

Toad for Oracle offers unique functionality for development managers and team leaders in the key areas of productivity, accuracy, quality, reliability, automation, reporting, manageability, performance and scalability.

Step 1 - Develop

Using Toad's Project Manager, project code can be selected directly from the Version Control archive. It can then be scheduled for an automated code review and SQL performance scan using Code Xpert.

Management reporting through a Code Dashboard enables better decisions about which code for each team requires re-work, and which code can be passed for tuning and scalability testing prior to production release.

Step 2 - Optimize

Toad's SQL optimization technology allows critical SQL statements or PL/SQL code to be improved automatically and thoroughly optimized. The tool:

- Scans application source code and identifies poor, under-performing SQL
- Generates every possible re-write and frees up the trial-and-error process
- Benchmarks and compares the fastest alternate statement
- Automates the optimization process, guaranteeing semantic equivalency and discarding those of minimum benefit
- Ensures optimal performance and eliminates the current manual process

Step 3 – Validate

Before code is deployed into production, it is essential to validate performance and scalability. Toad's scalability testing technology allows critical SQL statements or PL/SQL code to be submitted for scalability testing. It does this by making hundreds of user connections to the Oracle development test server to see if the tuned code is likely to scale successfully in a production environment.

Development teams should implement fully integrated tools that support these paradigms and offer unprecedented management controls. The negative impact to the business -- project overrun, poor code quality, integrity and under-achieving performance -- can result in a failure to:

- Achieve critical business objectives (including SLAs)
- Address compliance issues
- Maintain a competitive edge

ADDITIONAL BENEFITS

Toad's Worldwide Community

Toad's vibrant, worldwide community drives Toad product development to ensure that Toad for Oracle remains a world-class solution. The community provides Oracle database professionals with essential features and benefits guaranteed to deliver a sound return on investment.

Last year, Quest launched Toad World, a community web portal exclusively for Toad users worldwide. Toad World provides users with everything they need in one place – expert blogs, exclusive software, a Wiki (Ask Toad), event notices, discussion boards, free downloads and much more. (www.toadworld.com)

Additional Resources

To learn more about best practices, check out the [Database Development Best Practices](#) video with Steven Feuerstein, available exclusively on Toad World.

ABOUT THE AUTHOR

John Pocknell is a product manager at Quest Software working at the company's European headquarters in Maidenhead, UK. He has been with Quest since 2000, focusing on the database design, development and testing product areas. John also spends a significant amount of time with customers at Toad and Oracle user group meetings throughout Europe and the Asia-Pacific region, promoting Toad and presenting Toad training courses.

John has worked in IT for over 20 years, primarily in Oracle-based application design and development. He is also an aeronautical engineer, with more than 10 years of experience as a business development manager delivering IT consultancy services and implementing quality assurance systems to the ISO 9001 standard.

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Quest Software, Inc. delivers innovative products that help organizations get more performance and productivity from their applications, databases and Windows infrastructure. Through a deep expertise in IT operations and a continued focus on what works best, Quest helps more than 50,000 customers worldwide meet higher expectations for enterprise IT. Quest's Windows Management solutions simplify, automate and secure Active Directory, Exchange and Windows, as well as integrate Unix and Linux into the managed environment. Quest Software can be found in offices around the globe and at www.quest.com.

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