

Effective Way to Increase Performance in ERP Projects

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ABSTRACT

Sometime a problem that occurs in organizations is when there is no current DBA function in the organization. For some organizations, the ERP application is their introduction to database management systems and relational technology. In this case, a DBA function should be created before the ERP system is selected to ensure that the right decisions are made. Failure to do so can result in bad decisions, which in turn can cause the ERP implementation to fail. If the implementation does not fail completely, other problems can occur afterward that are difficult to fix and could have been avoided with proper up-front planning. Examples of the problems that can occur include performance degradation, unmet service levels, and improper or non-existent backup and recovery plans. Organizations implementing packaged applications should plan and budget for ongoing database administration as a key component of supporting the packaged application. The database administration function will ensure the acceptable, consistent performance for the packaged application, as well as ensuring an effective backup and recovery procedure, a workable database change management process, release management and data migration, and enhancing overall data availability. To accomplish this requires a working knowledge of both the package itself and the DBMS used by the package. Without a mixture of these skills, the performance of the application is likely to suffer. In the worst case scenario, the ERP implementation may fail completely.

Keywords

ERP, relational technology, up- front planning, performance degradation, backup, recovery, data migration, storage manager and release management, DaaS.

1. INTRODUCTION

Enterprise Resource Planning software systems (ERP) encompass a wide range of software products supporting day-to-day business operations and decision-making. Enterprise Resource Planning (ERP) is all the rage these days. Some of the largest software vendors on the planet are offering ERP solutions. These include companies like SAP, Oracle, and PeopleSoft. Corporate computing with ERPs allows companies to implement a single integrated system by replacing or reengineering their mostly incompatible legacy information systems. An ERP solution is basically a packaged-application that provides enterprise level computing serves many industries and numerous functional areas in an integrated fashion, attempting to automate operations from supply chain management, inventory control, manufacturing scheduling and production, sales support, customer relationship management, financial and cost accounting, human resources and almost any other data oriented management process. ERP systems are designed to enhance organization's competitiveness by upgrading an organization's ability to generate timely and accurate information throughout the enterprise and its supply chain.

ERP database is one of company's most important assets. Keeping that ERP database fully protected from threats such as security breaches, performance issues, and technical breakdowns is crucial to ensuring continuity and consistency in your most important business activities. The most important thing to remember when putting measures in place to protect your ERP environment is to not only safeguard the ERP database and related systems, but to secure all other systems that share information with it.

Database administration needs to be involved in every step of the ERP implementation process. During the planning and selection phase the DBA needs to understand the database schema and the options for DBMS support. Most ERP vendors support multiple RDBMS products. The DBA function will be able to best decide which of the various options makes the most sense. For example PeopleSoft systems are implemented using SQL Server on Windows NT, Oracle on Sun Solaris, or DB2 on the mainframe. Each option has its strengths and weaknesses. The DBA can help to enumerate these and make the best decision for your organization based on the current environment.

2. LITERATURE REVIEW

Avoiding more drastic forms of customization are critical because changes move the system away from a packaged solution—and the organization away from the enterprise system benefits it seeks to achieve. Also, technical changes are costly and can lead to schedule slippage because they are complex and need significant testing. In addition, the team must re-implement them for each package release, which increases long-term maintenance costs. Hence customization is considered as the first crucial technical factor for ERP performance.

Software metrics can be used in many ways, in a software organization, the three main uses of metrics data are: project planning, monitoring and controlling a project, and overall process management and improvement. Software engineering metrics allow us to

- (i) Quantitatively define success and failure, and/or the degree of success or failure of a product;
- (ii) Identify and quantify improvement, lack of improvement, or degradation in our products and processes;
- (iii) Make meaningful and useful managerial and technical decisions.

Thus, effective usage of software metrics for software process improvement in ERP projects is the second factor deciding its performance.

The process database is a repository of process performance data from successful projects, which can be used for project planning, estimation, analysis of productivity and quality and other purpose. The data captured in the process database can be classified into the following categories: Project characteristics, Project schedule, Project effort, Size and Defects.

Findings

- Excess customization, lower will be the performance of ERP projects.
- Software metrics leads to software process improvement for ERP projects.
- Optimum usage of process database leads to successful ERP implementation.

3. RESEARCH METHODOLOGY

Secondary data for research was collected from related books, publication, case studies.

Primary data has been collected through questionnaire-cum-interview technique.

4. SECURITY OF ERP DATABASE

ERP addresses your security needs in authentication, access control and user management. An integrated solution identifies the user, determines what the user can do, determine the level of trust the user should receive, protects your data. With advanced administration techniques and redundant server set-ups, DBA can ensure that your ERP database is available and readily accessible at all times. By monitoring performance around-the-clock, DBA can immediately identify and troubleshoot problems, to prevent productivity slow-downs caused by down time. Role-based IDs and passwords will ensure that users can access only the data they are authorized to view, based on their job function or position within the organizations. By making users change their passwords on a regular basis, DBA can add an additional layer of security. And, data encryption, firewalls, and other measures can help DBA keep hackers, cyber-criminals, and other outsiders far away from ERP database.

Without a solid, well-designed back-up plan in place, natural disasters such as flood and fire can bring permanent loss of the mission-critical information contained in ERP database. DBA always advice to customers to have a mirror-server located in a different location to avoid such a drastic situation. Apart from this, ERP database should be backed up at least once a week, although daily back ups are recommended and offer the most protection, to an off-site location.

Enterprises implementing packaged applications should solicit DBA participation in the package selection process to avoid future database management problems. It is wise to plan for DBA support before and during ERP implementation, instead of taking the reactive approach of consulting DBA after ERP implementation. This approach will ensure that an effective and appropriate infrastructure will be in place to manage the performance of the ERP application and its underlying databases.

5. ERP DATABASE PERFORMANCE TUNING

The following are the major ERP database performance tuning opportunities:

- System Parameters: Concurrent Sessions & Users, Checkpoints, Locking, Logging
- Memory Utilization: Processes, Database Kernel, Buffer Pool/Data Cache, Log Buffers, Other System Buffers, Sort Work Area
- I/O and Disk Utilization: Raw Partitions vs. File Systems, Partitioning, Replication, Fragmentation, Extents, Free Space, Hot Spots, Row Chaining, Row Migration, Page Splits.
- Processor (CPU): CPU Speed, Parallelism.
- Database Design: Physical File (e.g., Parameters, Layout, Size), Table Design, Data Clustering, Index

Design, Normalization and De-normalization, Constraints (referential, check, unique, etc.)

- SQL and Application Code: SQL Coding, Joins and Sub-queries, Avoiding Sorts, Statistics, Optimization, Explain and/or "show plan", Static vs. Dynamic SQL, Stored Procedure/Trigger Compilation, user-defined functions

Efficient Indexing

Probably the most important determinant of relational performance is creating an effective indexing scheme. Improperly defined indexes can significantly degrade application performance, particularly for high-volume OLTP applications. Although the actual code in the ERP application cannot be modified without risking the loss of vendor support, indexes can be added, removed and changed to optimize data access. Some packages enable customers to specify their own keys. In this situation, the DBA must create supporting indexes because the ERP vendor does not have the necessary information to supply the appropriate indexes. Yet, it is important to create only those indexes that are required to maintain uniqueness or enhance performance because irrelevant indexes incur DBMS overhead thereby degrading overall application performance.

6. RELEASE MANAGEMENT AND MIGRATION ISSUES

Another area where DBA participation is must is release management and migration to new versions of the ERP package. Each new release of the package most likely will be vastly different than the prior release. Each company has its own specific database implementation encompassing database security, object sizes, customized views, indexes, and other differences from the other ERP system. Finding these hundreds or thousands of differences can put quite a strain on the DBA requiring months of tedious effort. Automated tools are used that quickly pinpoint where customizations and differences exist between the new version of the database in the latest ERP version and a customer's already-implemented version of the software. Database change management, comparison, and migration tools exist that DBAs can use to minimize this effort.

7. NEED OF STORAGE MANAGER FOR ERP

As part of the planning process the DBA group will need to ensure that the appropriate database management tools are in place to support the ERP application. Although ERP vendors usually provide some level of DBA support within their products, most organization with heavy ERP usage plans and those with more than one database application will need to acquire more sophisticated database administration tools. Failure to do so may cause problems such as inflexible production data structures or data loss during recovery.

DBA can improve the availability of ERP database servers and reduce administration workload with automated data protection designed for ERP environments such as Tivoli storage manager for mySAP/SAP R3.

- Delivers business value by focusing on automated operation, built-in productivity aids, optimum performance and investment protection.
- Relieves administrators from repetitive tasks with a browser-based central control point that provides information about data transfer performance, including bottlenecks, and system backup status, including detailed information on individual jobs.

- Enables multiple ERP database servers to share a single Storage Manager server to automatically manage the backup data.
- Supporting large-volume data backups, data recovery, data cloning and disaster recovery of multiple ERP database servers.
- Provides more flexibility on server side maintenance tasks.
- Performs online, consistent and centralized backups to avoid downtime, protect vital enterprise data infrastructure and minimize operation costs.

8. DaaS

Database-as-a-Service (DaaS) provides the ability to leverage the services of a remotely hosted database; sharing it with other users and having it logically function as if the database were local. Users can self-provision a database, create the tables, load the data, and access the data using the interface provided, all on demand and using cloud computing. Database maintenance, including backing up and restoring the database, managing users, upgrades and bug fixes to the database are done by DaaS provider. Instead users can focus on database design and usage.

9. CONCLUSION

Hence we can conclude that addressing these crucial technical factors will definitely bring higher performance to the ERP projects. Though many ERP packages provide built-in performance monitoring capabilities, these are rarely sufficient for in-depth, enterprise-wide performance management. As usage of the packaged application grows, or if multiple packaged or in-house applications are deployed, agent-based performance management tools will be required. Many of these tools have specialized components for managing packaged applications. Agent-Based Performance Management tools enable real - time, and historical performance monitoring and analysis; reporting and graphing; drill down from system level to specific performance details; and the ability to automate tuning using thresholds and alerts. These tools are able to communicate with end users and other agents reacting to specific pre-defined events and initiating action to correct the identified problem situations. Successful alignment of business and IT will maximize enterprise performance. This will only be achieved by organizations that understand how to develop and maintain an accurate model of

their companies' business and strategy architectures and provide value to the business through their introduction of automation solutions.

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