

## Application Data Layer Tuning

### What is Application Data Layer Tuning?

Application Data Layer Tuning is a service by ClickSoftware intended to improve the performance of your Service Optimization solution. The service focuses on the critical interaction between the application and the database – an area that substantially affects the performance of the overall solution.

### Who needs the service?

*Are you about to rollout your Service Optimization solution to new regions?*

*Do you have new types of work that you added to your scheduling environment?*

*Did you introduce a new flow of work into your solution?*

*Are you planning any upgrades or functional changes to your application?*

*Are you experiencing performance degradation?*

In all of these cases this implies changes to your application's structure, an increase in data volumes, changes to the workflow and / or to the composition of the data.

Such changes may have a substantial affect on your solution's performance, scalability and data integrity, and require tuning to be performed by the application experts.

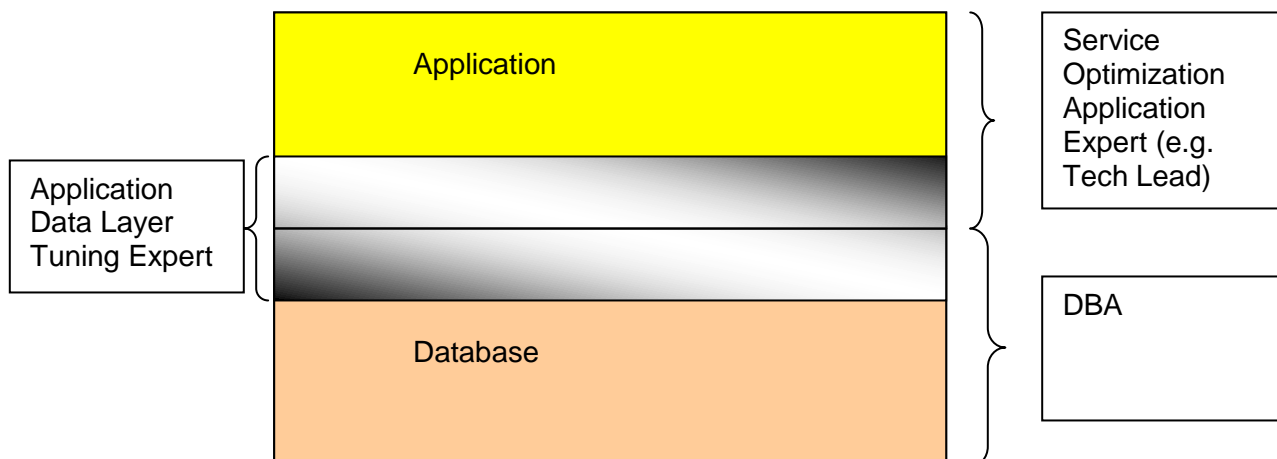
### How Does Application Data Layer Tuning Works

ClickSoftware's experts will perform a detailed survey of your application, looking to identify bottlenecks in performance and scalability. The survey is performed by an Application Data Layer Tuning expert, with a skill set combining DBA expertise with Application Expertise.

Coordination with the customer's DBA is critical to the success of the process, as it allows sharing of ideas and smooth implementation of proposed changes.

The activities involved in the survey are the following:

- Review the application looking for potential bottlenecks – the review includes:
  - o Familiarization with special configuration and customization
  - o Identification of special workflows and transactions involving use of high data volumes
  - o Interview of a technical resource who is familiar with the specific customer implementation



## How Does Application Data Layer Tuning Works Cont.

- Tune the application – the tuning is performed top down, using a tuning steps methodology, making sure that changes are applied based on the combination of how easy it is to make them vs. how effective they are in solving the problem at hand. At each step:
  1. A specific change to configuration or database setup is performed
  2. The change performed represents a solution for a pre-defined hypothesis
  3. The application is monitored with the change applied on it
  4. If the change helps (e.g., to improve performance), it is accepted and documented
  5. After each step a review is conducted validating how worthwhile it is to continue looking for further improvements (e.g., if we already improved the performance by 80% we will not spend another month looking for 5% further improvement)
  6. Create a set of automatic tools that will enable the customer to
    - o Easily apply the changes on their testing and then production environment
    - o Perform regression testing using a database script. The scripts help verifying that the changes made do not harm the current implementation, as well as make sure that in the future, when more updates are made to the application, the existing functionality is still intact
  7. Present conclusions to the customer including summary of changes made and the improvement achieved
  8. Provide the automatic tools to the customer representatives with instructions on when and how to use them

**Note:** The tuning activities focus on simple solutions that can be achieved via small changes to the application's configuration or database setup. If the ClickSoftware Data Layer consultant identifies that a solution for the problem at hand requires more substantial changes to the customer application or to the business workflow, she will present that to the customer for decision regarding further action.

Sample tuning activities include:

- Identify top SQL queries running in the system and monitor their behavior. In case of performance issues, look for efficient applicative replacements providing the same functionality
- Review data integrity, e.g., verify that all collections have uniqueness constraints on their CRM/ERP identifiers
- Verify that server caches are properly tuned for optimal performance
- Review volume of objects in the application – check whether all objects need to be kept in the application and if not, make sure purging is performed on a periodic basis
- Tune the use of database indices (working in coordination with the DBA) – looking to avoid full scans on large tables

### Benefits of Application Data Layer Tuning

- ✓ Improve applications' performance
- ✓ Improve the application's ability to further scale as your company grows
- ✓ Ensure a smooth rollout or other increase to data volumes
- ✓ Ensure a smooth upgrade or other functional change