

Crystal Cockpit

STORAGE MANAGER FOR RELATIONAL DBMS -
REQUIREMENTS SPECIFICATION

Nan Noon Noon, Behzad Garekani, André Khoury, Shan Mey Yew
GROUP JG1

Table of Contents

Introduction	2
Purpose.....	2
Scope	2
Glossary	3
System Overview	4
System Structure	5
Users	6
Administrator User:	6
Standard User:	6
Constraints	7
Time Constraint	7
Budget Constraint.....	7
Staff Constraint	7
Requirements.....	8
Priorities	8
Requirements Summary	8
Functional Requirements	10
F1 – Database Interaction	10
F2 – User Management.....	10
F3 – Creation Management	10
F4 – Deletion Management	11
F5 – Migration Management.....	11
F6 – Defragmentation Management	12
Non-functional requirements.....	13

Introduction

Purpose

In this document we are going to describe our new upcoming software, the “Storage Manager for Relational DBMS” and its functional and non-functional requirements. This purpose of this document is to describe every function of this application, directed towards group members, supervisor, course coordinator and the stakeholders.

Scope

The Storage Manager for Relational DBMS will provide a user-friendly interface and it will allow the user to directly create, delete, migrate and defragment on logical data objects, tablespaces, and persistent storage devices using click, move and point operations. This document describes the system overview in elaborate detail of the project structure and also includes functional and non-functional requirements for the Storage Manager for Relational DBMS project to measure the workload needed. Furthermore, this document elaborates priority (critical, high, medium, low) of each requirement and its description.

Glossary

Data Dictionary – It stores information about the structure of the database.

DDL – As known as Data Definition Language. A compiler generates a set of tables stored in a data dictionary.

DML – As known as Data Manipulation Language. A language for accessing and manipulating the data organized by the appropriate data model.

Function – An activity or purpose natural to or intended for a person or thing.

Index – An index is a performance-tuning method of allowing faster retrieval of records from database.

Materialized view – A materialized view is a database object that contains the results of a query

Migration – The process of transferring data between storage devices

Schema – The logical structure of the database.

System – A set of things working together as parts of a mechanism or an interconnecting network.

Tablespace – Tablespaces are the bridge between certain physical and logical components of the Oracle database

System Overview

Storage Manager is a managing client for database, which can simply manipulate a database from head to toe, with a unique graphical user interface. Its main purpose is to provide software which does not need extensive knowledge to operate an Oracle based database.

Storage Manager allows a user to import than own oracle database through SQL or create a new one from scratch. This can then be altered with many different options, never having to type in SQL statements again.

Once a database of choice has been entered the user can then specify which tablespace then would like to enter. With the easy GUI, the user also has options to import/export (Migration) on certain data objects. Such as, moving a tablespace to another database. More advanced features include moving the database to another partition.

Modifying a complete database cannot be given to all patrons of database, such that, sensitive information could be loss. Consequently, the system will include a user management system, which will control which users are able to access a certain database. There will be two types of administrators; administrators of a database and administrators of a system. This, is to control the numbers of users in the overall system, otherwise accounts will be overflow the user database.

The system will also have a feature that will conduct a defragmentation process that can be conducted on four different levels of the database; the database as a whole, tablespace, segment and extent.

Another feature the management system will consist of is the automation of tablespace extensions when more persistent storage is needed. This feature is included to prevent the user from dealing with resizing a tablespace when the maximum number of extents is reached.

System Structure

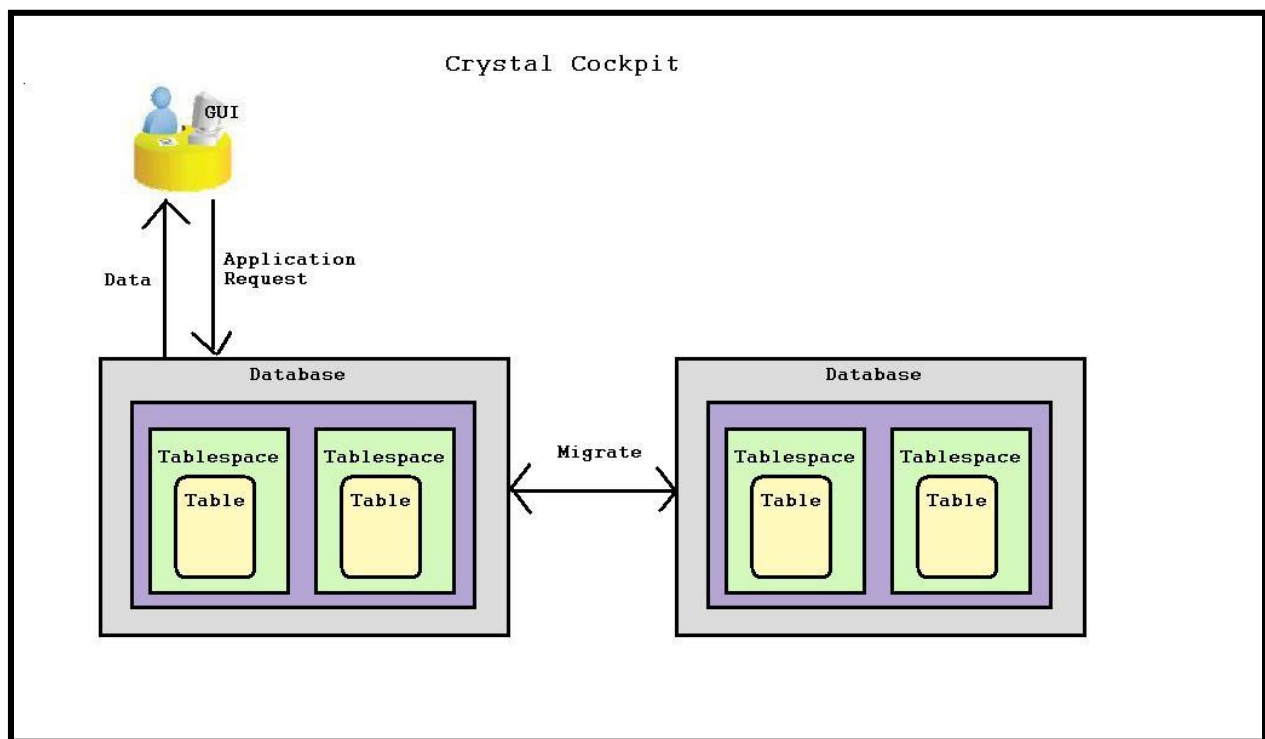
The database structure shows that the user using a graphical user interface application to interact with the database system. In the database the table is stored inside the tablespace. When the user calls the migrate function, the database will migrate this database to another database.

GUI provides functions so the user can manage their own database, thoroughly, with such options as, creation, deletion, defragmentation and migration of logical data objects. It also provides the user with a friendly interface which can interact with database. Moreover, this interface provides an administrator to manage user access of the database.

The system sends out the application request from the user interface to the database to pull out the information that user requested.

Data: It will receive information from the database that is requested by the application.

Migration: It allows user to duplicate a database from one place to another place or one drive to another and also allow the user to move the database from one place to another.



Users

There are three types of users defined in the crystal cockpit system.

Administrator User:

We have two types of administrator users:

Database Administrator: Database Administrator is responsible for creating a primary database. This user is able to access to all the functionalities of the database. There is no limit of accessibility for this user.

User Administrator: This user is responsible for managing and controlling other users of the system. The level of their accessibility and memory space will be defined in the creation of the user. User administrator will also define a number of table spaces they can access and functionality that the user is involved in.

Standard User:

This user has access only to its own data. The access control of this user is limited to its own elements. This user can only edit and delete its own properties. The administrator user will define scope and memory space of a standard user.

Constraints

There are number of project constraints which have a direct impact on how the project is planned and tracked, and on what can be developed by the deadline.

According to the project constraints the team decide which features are feasible to be delivered. Some of the features are added to the project with low priority. If the development process is in best condition there is a possibility to implement a low-level priority requirement. Below is listed the main constraints of the project:

Time Constraint

The project should be delivered by week 13 session two. There is no chance of extension for the deadline.

Budget Constraint

There are constraints on the budget or ventured capital dollars available to be used towards the development of the product. The team is not earning any salary or income through this project.

Staff Constraint

There is a limit on the number of the developers of the project. There should not be more than four programmers.

Requirements

Priorities

Critical - Requirements that must be delivered for the program to justify its uniqueness to the user. Program remains useless without them.

High - Requirements, which are part of the essentials and an extension to the core/critical requirements.

Medium - Requirements that are recommended but are not needed. The program will function more smoothly with them.

Low - Requirements that are completely optional. Added to the requirements specification to provide options for a more developed product. Only if time is with us.

Requirements Summary

ID	Requirement	Priority
F3.1	Create Table	Critical
F3.5	Create Tablespace	Critical
F4.1	Delete Table	Critical
F4.5	Delete Tablespace	Critical
F5.2	Export/Import Table	Critical
F5.3	Export/Import Tablespaces	Critical
F5.4	Export/Import Database	Critical
F5.5	Export/Import User	Critical
F6.1	Database Defragmentation	Critical

ID	Requirement	Priority
F3.2	Create Index	High
F3.3	Create View	High
F4.2	Delete Index	High
F4.3	Delete View	High
F5.1	Export/Import Schema	High
F6.2	Tablespace Defragmentation	High
F6.3	Segment Defragmentation	High
N1	Training, ease of use	High
N2	Programming Language	High
N3	Platform	High
N6	Maintainability	High

ID	Requirement	Priority
F1.1	Front-end Database Interaction	Medium
F2.2	Login	Medium
F3.4	Create Sequence	Medium
F3.7	Create Materialized View	Medium
F4.4	Delete Sequence	Medium
F4.6	Delete Materialized View	Medium
N5	Help	Medium

ID	Requirement	Priority
F2.1	Modify User Database	Low
F2.3	Change Password	Low
F3.6	Create Procedure	Low
F5.6	Migrating a database across platforms	Low
N4	Multi-Platform	Low

Functional Requirements

F1 – Database Interaction

ID: F1.1	Requirement: Front-end Database Interaction	Priority: Medium
Description: The front-end is able to retrieve and store information about users and database content.		

F2 – User Management

ID: F2.1	Requirement: Modify User Database	Priority: Low
Description: The system will allow an admin to create, edit and delete a user.		

ID: F2.2	Requirement: Login	Priority: Medium
Description: The system will allow users to log into the system using a username and password. If the given “username” and “password” is incorrect, the system provides an error message.		

ID: F2.3	Requirement: Change Password	Priority: Low
Description: The system allows the user to change their login password. A valid password must contain at least 8 characters and must include at least a number and a letter.		

F3 – Creation Management

ID: F3.1	Requirement: Create Table	Priority: Critical
Description: The system will allow the user to create a table into the database.		

ID: F3.2	Requirement: Create Index	Priority: High
Description: The system will allow the user to create an index automatically or manually.		

ID: F3.3	Requirement: Create View	Priority: High
Description: The system will allow the user to create a view in the user’s schema.		

ID: F3.4	Requirement: Create Sequence	Priority: Medium
Description: The system will allow the user to create a sequence in the user’s schema		

ID: F3.5	Requirement: Create Tablespace	Priority: Critical
Description: The system will allow the user to create a tablespace into the database.		

ID: F3.6	Requirement: Create Procedure	Priority: Low
Description: The system will allow the user to create a stored procedure, function, or package in the user schema.		
ID: F3.7	Requirement: Create Materialized View	Priority: Medium
Description: The system will allow user to create materialized view.		

F4 – Deletion Management

ID: F4.1	Requirement: Delete Table	Priority: Critical
Description: The system will allow the user to delete a table into the database.		
ID: F4.2	Requirement: Delete Index	Priority: High
Description: The system will allow the user to delete an index automatically or manually.		
ID: F4.3	Requirement: Delete View	Priority: High
Description: The system will allow the user to delete a view in the user's schema.		
ID: F4.4	Requirement: Delete Sequence	Priority: Medium
Description: The system will allow the user to delete a sequence in the user's schema		
ID: F4.5	Requirement: Delete Tablespace	Priority: Critical
Description: The system will allow the user to delete a tablespace into the database.		
ID: F4.6	Requirement: Delete Materialized View	Priority: Medium
Description: The system will allow user to delete materialized view.		

F5 – Migration Management

ID: F5.1	Requirement: Export/Import Schema	Priority: High
Description: The system will allow the user to choose a schema to export and import. And also allow the user to choose the direction to export/import from the file. Before import/export, the system will check space of disk to read/write the file. If is not enough system will terminate and show the notification.		

ID: F5.2	Requirement: Export/Import Table	Priority: Critical
Description: By using tablespace parameters, the system will allow the user to export / import the set of tables. And also allow the user to choose the direction to export/import from the file. Before import/export, the system will check space of disk to read/write the file. If is not enough system will terminate and show the notification.		
ID: F5.3	Requirement: Export/Import Tablespaces	Priority: Critical
Description: By using tablespace parameters, the system will allow the user to export/import tablespaces. And also allow the user to choose the direction to export/import from the file. Before import/export, the system will check space of disk to read/write the file. If is not enough system will terminate and show the notification.		
ID: F5.4	Requirement: Export/Import Database	Priority: Critical
Description: The system will allow the user to export/import the database. And also allow the user to choose the direction to export/import from the file. Before import/export, the system will check space of disk to read/write the file. If is not enough system will terminate and show the notification.		
ID: F5.5	Requirement: Export/Import User	Priority: Critical
Description: The system will allow the user to export / import the user database (such as tables, grants, indexes and procedures) from one database to another database.		
ID: F5.6	Requirement: Migrating a database across platforms	Priority: Low
Description: The system will allow the user migrate the whole database from one platform to another platform.		

F6 – Defragmentation Management

ID: F6.1	Requirement: Database Defragmentation	Priority: Critical
Description: The system will allow the user to defragment the entire database.		
ID: F6.2	Requirement: Tablespace Defragmentation	Priority: High
Description: The system will allow the user to defragment at a tablespace level.		
ID: F6.3	Requirement: Segment Defragmentation	Priority: High
Description: The system will allow the user to defragment at a segment level.		
ID: F6.4	Requirement: Extent Defragmentation	Priority: Medium
Description: The system will allow the user to defragment at an extent level.		

Non-functional requirements

ID: N1	Requirement: Training, ease of use	Priority: High
Description: Build user-friendly interface. And user can able to learn how to use the function of the system around (10 to 15 minutes).		
ID: N2	Requirement: Programming Language	Priority: High
Description: Using Java languages for GUI interface and make connection with Oracle. To build the data and give information of database, using the Oracle server with SQL language.		
ID: N3	Requirement: Platform	Priority: High
Description: Application can run on window platform as offline.		
ID: N4	Requirement: Multi-Platform	Priority: Low
Description: Application can run all kind of platform (Window, Linux, Mac).		
ID: N5	Requirement: Help	Priority: Medium
Description: Application provide help and FAQ via product website. And also provide online discuss forum.		
ID: N6	Requirement: Maintainability	Priority: High
Description: Ease to maintain for further implementation. Just follow the product breakdown structure and make changes.		