



**Your Company Name**

# **Database Design Document**

Date

www.SDLCforms.com



Revision History

Date	Version	Author	Change

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*Note: Text displayed in blue italics is included to provide guidance to the author and should be deleted before publishing the document. In any table, select and delete any blue line text; then click Home→Styles and select “Table Text” to restore the cells to the default value.*

## 1 Purpose

The Database Design Document maps the logical data model to the target database management system with consideration to the system’s performance requirements. The Database Design converts logical or conceptual data constructs to physical storage constructs (e.g., tables, files) of the target Database Management System (DBMS).

### 1.1 Document Objectives

The Database Design Document has the following objectives:

- To describe the design of a database, that is, a collection of related data stored in one or more computerized files that can be accessed by users or computer developers via a DBMS.
- To serve as a basis for implementing the database and related software units. It provides the acquirer visibility into the design and provides information necessary for software development.

### 1.2 Intended Audience

This document is intended for the following audiences:

- Technical reviewers, who must evaluate the quality of this document.
- Developers including:
  - Architects, whose overall architecture design must meet the requirements specified in this document.
  - Designers, whose design must meet the requirements specified in this document.
  - Developers, whose software must implement the requirements specified in this document.
  - Quality Assurance personnel, whose test cases must validate the requirements specified in this document.

### 1.3 Acronyms and Abbreviations

Acronym / Abbreviation	Meaning
RDMS	Relational Database Management System
DBA	Database Administrator



## 1.4 Key Personnel

*Identify the roles/personnel that may be needed to gather additional information.*

Role	Name	Email Address	Phone Number
DBA	Robert Rogers	<a href="mailto:rrogers@anycompany.com">rrogers@anycompany.com</a>	999-999-9999

## 1.5 Data Owners

*Identify the name and types of data of personnel who are responsible for data quality and accuracy of that data.*

Type of Data	Name	Email Address	Phone Number

## 2 Assumptions, Constraints and Dependencies

### 2.1 Assumptions

*Describe any assumptions that influence the database design.*

### 2.2 Constraints

*Describe any constraints or limitations that have an impact on the database design.*

### 2.3 Dependencies

*Describe any dependencies that have an impact on the database design such as related hardware or software or operating systems.*



### 3 System Overview

*Describe the system or application for which this database will be designed. This serves as the high level starting point by which architects and developers can commence their efforts.*

#### 3.1 Database Management System Configuration

*Identify the vendor, version and targeted hardware for the database management system. Highlight any restrictions on the initialization and use of the DBMS.*

Vendor	Product	Version	Restrictions

#### 3.2 Database Software Utilities

*Identify any utility software that will be used to support or maintain the database.*

Vendor	Product	Function

#### 3.3 Support Software

*Identify any support software directly related to the database, including the name, version and function performed by that software. Examples include query languages, report writers, etc.*

Vendor	Product	Function



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## 4 Architecture

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### 4.1 Hardware Architecture

*Provide a brief overview of the hardware architecture with supporting diagrams (flow charts, schemas, sub-schemas, etc.) that will illustrate how components are connected. Provide illustration of hardware configurations on which the database will reside.*

### 4.2 Software Architecture

*List the components within the subsystem / application. Provide component diagrams to illustrate connections within the application and external systems, including components, datastores and interfaces within the application as well as interfaces between internal components and external systems.*

### 4.3 Datastores

*Identify and describe all datastores including databases, file systems and media datastores.*

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## 5 Database-Wide Design Decisions

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This section documents decisions about the database behavioral design as to how it will behave from a user's viewpoint in meeting its requirements, ignoring internal implementation, and other decisions affecting the design of the database.

### 5.1 Interfaces

*Identify the decisions regarding queries or other inputs the database will accept and outputs (displays, reports, messages, responses, etc.) it will produce, including interfaces with other systems and users.*

### 5.2 Key Factors Influencing Design

*Identify those key functional and non-functional requirements that influenced the design.*

### 5.3 Behavior

*Discuss decisions on behavior in response to each input or query including actions, response times, and other performance characteristics, selected equations, algorithms, rules, disposition, and handling of unallowed inputs.*

### 5.4 DBMS Platform

*Discuss decisions on the platform to be used (including the name and version and release), and type of flexibility to be built into the database for adapting to changing requirements.*





## 5.5 Security and Availability

*Identify any integrity and access controls that apply to database components such as the schema, sub-schemas, partitions or physical files, records or tables, sets or relations, and data elements. In addition, define classifications of users and their general access rights.*

## 5.6 Distribution

*Discuss decisions on distribution of the database (e.g., client/server), master database file updates and maintenance, including and maintaining consistency, establishing / re-establishing synchronization, enforcing integrity and any business rules.*

## 5.7 Backup and Restore Operations

*Discuss decisions on backup and restoration including data and process distribution strategies, permissible actions during backup and restoration, and special considerations for new or non-standard technologies such as video and sound.*

## 5.8 Maintenance

*Discuss decisions on repacking, sorting, indexing, synchronization, and consistency including automated disk management and space reclamation considerations, optimizing strategies and considerations, storage and size considerations, population of the database, and capture of legacy data, if necessary.*

## 5.9 Performance and Availability Decisions

*Discuss how performance and availability requirements will be met.*

## 6 Database Administrative Functions

### 6.1 Responsibility

*Identify the organizations and personnel responsible for the database administration functions: database administrator, system administrator, and security administrator.*

Role	Name	Responsibility	Email Address
Database Administrator			
System Administrator			
Security Administrator			



## 6.2 Database Identification

*Identify the labels by which the database will be identified.*

Element	Element Name	Description
<i>db_name</i>	<i>Database name</i>	<i>The name the database was given when originally created.</i>
<i>db_path</i>	<i>Database path</i>	<i>The full path to where the database is stored on the system.</i>
<i>db_location</i>	<i>Database Location</i>	<i>The location of the database in relation to the application.</i>
<i>db_storage_path</i>	<i>Database Path</i>	<i>The full path of a location that is used by the database for placing automatic storage tables.</i>

## 6.3 Application / Systems Using the Database

*Identify the applications / systems that will use the database, including the full system identification and model, version number, and system code.*

System ID	Model	Version #	System Code

## 6.4 Relationship to Other Databases

*List any other databases with which this database will interface or supersede.*

This Database	Supersedes This Database	Interfaces with the Database

## 6.5 Schema Information

*Describe the overall structure of the schema and other global definition of the database.*



## 6.6 Schema Description

*Describe the schema and each sub-schema including name, file type, data description language, access control keys, concurrence locking, data name mapping, overall partition/file limitations and controls, redefinitions and access path restrictions.*

Script	Description

## 6.7 Physical Design

*Incorporate a diagram illustrating the physical design of the database.*

## 6.8 Physical Structure

*Incorporate a diagram illustrating the physical structure (i.e., partitions, files, indexes, pointers) of the database.*

## 6.9 Entity Mapping

*Identify the mapping rules and list tables and columns that either do not originate from a single entry or are not implemented.*

## 6.10 Mapping Rules

*Identify rules for mapping entries to tables.*

## 6.11 Operational Implications

*Describe operational implications of data transfer, refresh and update scenarios and expected windows, including security implications.*

## 6.12 Data Transfer Requirements

*Describe data transfer requirements to and from the software, including data content, format, sequence, volume/frequency, and any conversion issues.*

## 6.13 Data Formats

*Describe the formats of both the sending and receiving systems, including the data item names, codes, or abbreviations that are to be interchanged, as well as any units of measure/conversion issues.*



## 6.14 Business Rules

*Describe the business rules modeled in the data model, specified for entries in the data model or in the functional specifications that have not been implemented as table/column.*

Business Rule	Implemented

## 6.15 Storage

*Provide sizing formulas for determining the storage required to support the database, including estimates of the internal and peripheral storage requirements.*

## 6.16 Backup and Recovery

*Describe the desired strategies and scheduling for periodic backups of the data. Explain how data schemas and support files will be recreated or recovered in the event of a system disaster.*

# 7 Detailed Database Design

*Describe the design of the DBMS files associated with the database, and any non-DBMS files pertinent to the database design. You may want to, depending on the design, to include references about Logical Data Models (LDM), LDM Entity Relationship Diagrams (ERD), Physical Data Models (PDM), and a comprehensive Data Dictionary showing datastores, data element names, types, length, source, constraints, validation rules, etc.*

## 7.1 Data Software Objects and Resultant Data Structures

*For each functional data object, specify the data structure(s) which will be used to store and process the data. Describe any data structures that are a major part of the system, including major data structures that are passed between components. List all database objects including stored procedures, functions and function parameters. For file structures and their locations. Explain how data may be structured in the selected DBMS, if applicable. For networks, detail the specific distribution of data.*

*Provide the detailed description of any non-DBMS files (e.g., property files) that are required for DBMS functioning or maintenance and are not already addressed in the SDD. Include a narrative description of the usage of each file that identifies if the file is used for input, output, or both, and if the file is a temporary file. Also provide an indication of which modules read and write the file (refer to the Data Dictionary). As appropriate, include file structure information.*



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## 7.2 Database Management System Files

*Provide an appropriate level of detailed design of the DBMS files, based on the DBMS chosen. Describe support performance objectives. Include the following information, as appropriate (refer to the Data Dictionary):*

- *Physical description of the DBMS schemas, sub-schemas, records, sets, tables, storage page sizes, etc. A PDM ERD should be included in an appendix.*
- *Objects created to support access methods (e.g., indexed, via set, sequential, random access, sorted pointer array, etc.)*
- *Distribution, partitioning, or other compartmentalization of the data to support design.*

## 8 Reporting Requirements

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*Describe any reporting requirements.*

## 9 Appendix

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