***PRACTICAL–8***

**Aim:** **Prepare a Data Dictionary for Software domain platform**

* **Data Dictionaries:**
* Data Dictionary is the major component in the [structured analysis](https://www.geeksforgeeks.org/structured-analysis-and-structured-design-sa-sd/) model of the system. It lists all the data items appearing in [DFD](https://www.geeksforgeeks.org/what-is-dfddata-flow-diagram/). A data dictionary in Software Engineering means a file or a set of files that includes a database’s metadata (hold records about other objects in the database), like data ownership, relationships of the data to another object, and some other data**.**
* It provides a detailed description of the data, including its meaning, relationship to other data, usage, and format.
* These are important in database management, data modelling, and software development.
* It helps to ensure consistency, clarity, and efficient data management.
* It helps to ensure that everyone in the organization understands the data, how it should be used, and how it should be managed.
* It is essential for maintaining data quality and facilitating effective data governance.
* **Components of Data Dictionary:**

**1. Metadata (Data About Data)**

* Provides details about data elements in a structured way.

**2. Data Elements (Attributes)**

* **Name**: Unique name of the data element.
* **Description**: Explanation of the data item’s purpose.
* **Data Type**: Specifies if the data is an integer, string, float, date, etc.
* **Length**: Defines the maximum storage size (e.g., VARCHAR(255), INT(10)).
* **Default Value**: The preset value if no input is provided.
* **Allowed Values (Domain)**: Lists valid values (e.g., Gender: Male/Female/Other).
* **Constraints**: Defines rules (e.g., NOT NULL, UNIQUE, PRIMARY KEY).

**3. Data Structures**

* Tables, files, records, and relationships between different data entities.

**4. Data Relationships**

* **Primary Key (PK)**: Uniquely identifies each record in a table.
* **Foreign Key (FK)**: Establishes a link between two tables.
* **Indexes**: Optimizes search operations.

**5. Data Flows**

* Shows how data moves between different components of a system.

**6. Data Ownership & Security**

* Defines who owns, manages, and accesses the data.
* Specifies user roles and permissions (e.g., read-only, edit, delete).

**7. Business Rules**

* Defines how data should be used and processed (e.g., Age must be > 18).

**8. Data Sources & Lineage**

* Tracks where the data originates from and how it has transformed over time.

**9. Data Maintenance Rules**

* Policies for data updates, deletions, and archiving.

**10. Synonyms & Aliases**

* Different names used for the same data element across systems.
* **Uses of a Data Dictionary:**

A **Data Dictionary** is a document or tool that describes the details of a database or system. It is used for:

1. **Database Management** – Keeps data **organized, consistent, and accurate** in a database.
2. **Software Development** – Helps developers understand **data structure** when building applications.
3. **Data Security & Compliance** – Ensures only authorized users can **access or modify** data.
4. **Data Analysis & Reporting** – Makes sure reports are based on **correct and uniform data**.

* Data Dictionary for Online Job Portal

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| **1. Users Table (Stores user details)** |
| | **Field Name** | **Data Type** | **Constraints** | **Description** | | --- | --- | --- | --- | | UserID | INT | PRIMARY KEY, AUTO\_INCREMENT | Unique ID for each user | | Name | VARCHAR(100) | NOT NULL | Full name of the user | | Email | VARCHAR(150) | UNIQUE, NOT NULL | User’s email address | | Password | VARCHAR(255) | NOT NULL | Encrypted user password | | Role | ENUM('Job Seeker', 'Employer') | NOT NULL | Defines user type | | Contact | VARCHAR(15) | UNIQUE | User's phone number | | CreatedAt | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Account creation date | |
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| **2. Jobs Table (Stores job postings)** |
| | **Field Name** | **Data Type** | **Constraints** | **Description** | | --- | --- | --- | --- | | JobID | INT | PRIMARY KEY, AUTO\_INCREMENT | Unique job ID | | EmployerID | INT | FOREIGN KEY (Users.UserID) | ID of the employer who posted the job | | Title | VARCHAR(255) | NOT NULL | Job title | | Description | TEXT | NOT NULL | Detailed job description | | Location | VARCHAR(100) | NOT NULL | Job location | | Salary | DECIMAL(10,2) | NULLABLE | Salary offered | | Type | ENUM('Full-Time', 'Part-Time', 'Remote') | NOT NULL | Job type | | PostedAt | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Job posting date | |

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| **3. Applications Table (Tracks job applications)** |
| | **Field Name** | **Data Type** | **Constraints** | **Description** | | --- | --- | --- | --- | | ApplicationID | INT | PRIMARY KEY, AUTO\_INCREMENT | Unique application ID | | JobID | INT | FOREIGN KEY (Jobs.JobID) | Job being applied for | | UserID | INT | FOREIGN KEY (Users.UserID) | Job seeker applying | | Resume | VARCHAR(255) | NOT NULL | Path to uploaded resume | | Status | ENUM('Pending', 'Reviewed', 'Accepted', 'Rejected') | DEFAULT 'Pending' | Application status | | AppliedAt | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Application submission date | |

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| **4. Companies Table (Stores employer company details)** |
| | **Field Name** | **Data Type** | **Constraints** | **Description** | | --- | --- | --- | --- | | CompanyID | INT | PRIMARY KEY, AUTO\_INCREMENT | Unique company ID | | Name | VARCHAR(255) | NOT NULL | Company name | | Industry | VARCHAR(100) | NOT NULL | Type of industry | | Location | VARCHAR(100) | NOT NULL | Company location | | Website | VARCHAR(255) | NULLABLE | Official website | | ContactEmail | VARCHAR(150) | UNIQUE, NOT NULL | HR or support email | | CreatedAt | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Account creation date | |

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| **5. SavedJobs Table (Tracks jobs saved by users)** |
| | **Field Name** | **Data Type** | **Constraints** | **Description** | | --- | --- | --- | --- | | SavedID | INT | PRIMARY KEY, AUTO\_INCREMENT | Unique saved job ID | | UserID | INT | FOREIGN KEY (Users.UserID) | User who saved the job | | JobID | INT | FOREIGN KEY (Jobs.JobID) | Job that is saved | | SavedAt | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Date job was saved | |
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| **6. Reviews Table (Stores reviews of companies)** |
| | **Field Name** | **Data Type** | **Constraints** | **Description** | | --- | --- | --- | --- | | ReviewID | INT | PRIMARY KEY, AUTO\_INCREMENT | Unique review ID | | CompanyID | INT | FOREIGN KEY (Companies.CompanyID) | Reviewed company | | UserID | INT | FOREIGN KEY (Users.UserID) | User giving the review | | Rating | INT | CHECK (Rating BETWEEN 1 AND 5) | User rating (1-5) | | Comment | TEXT | NULLABLE | User feedback | | CreatedAt | TIMESTAMP | DEFAULT CURRENT\_TIMESTAMP | Review submission date | |