

Data Flow Diagram (DFD) Documentation - Dog Rescue System

What is a Data Flow Diagram?

A **Data Flow Diagram (DFD)** is a graphical representation that illustrates:

- **External entities** that interact with the system
- **Processes** that transform data within the system
- **Data stores** where information is maintained
- **Data flows** showing information movement between components

DFDs provide a structured approach to understanding system functionality and data movement.

DFD Notation Standards

Symbol	Component Type	Description
Rectangle	External Entity	Entities outside the system boundary (users, external systems)
Circle	Process	Functions that transform or manipulate data
Open Rectangle	Data Store	Repositories where data is stored and retrieved
Arrow	Data Flow	Movement of data between components

Level 0 DFD - System Context

Definition

Level 0 DFD provides a high-level overview of the entire system, showing major processes and their interactions with external entities and primary data stores.

Dog Rescue System - Level 0 Components:

External Entities:

- **Public User** - Unregistered website visitors
- **Registered User** - Authenticated users with extended privileges
- **Administrator** - System management personnel

Core Processes:

1. **Browse Dogs** - Dog catalog viewing and searching
2. **User Authentication** - Registration and login management
3. **Rescue Reports** - Found dog reporting system
4. **Volunteer Applications** - Volunteer registration process
5. **Admin Panel** - Administrative management interface

6. **User Dashboard** - User application tracking

7. **Adoption Applications** (*Planned*) - Pet adoption processing

Data Repositories:

- Dogs Database - Pet information storage
- Users Database - User account management
- Rescue Submissions - Found dog reports
- Volunteer Database - Volunteer applications
- Adoption Applications (*Planned*) - Adoption requests

Purpose:

Level 0 DFD establishes system scope and identifies primary functional areas.

Level 1 DFD - Process Decomposition

Definition

Level 1 DFD decomposes major processes from Level 0 into detailed sub-processes, showing internal data flows and process interactions.

Process Breakdown:

1. Browse Dogs Process:

- 1.1 Display Dog List - Retrieve and present available dogs
- 1.2 Filter Dogs - Apply search criteria and filters
- 1.3 View Dog Details - Display comprehensive dog information

2. User Authentication Process:

- 2.1 User Registration - Create new user accounts
- 2.2 User Login - Validate credentials and establish sessions
- 2.3 Token Validation - Verify session authenticity

3. Rescue Reports Process:

- 3.1 Submit Rescue Form - Capture found dog information
- 3.2 Validate Submission - Verify data completeness and accuracy
- 3.3 Store Rescue Data - Persist validated submissions

5. Admin Panel Process:

- 5.1 Manage Dogs - CRUD operations for dog records
- 5.2 Review Rescues - Process and update rescue submissions
- 5.3 Manage Volunteers - Handle volunteer applications
- 5.4 System Reports - Generate operational reports

6. User Dashboard Process:

- 6.1 View Profile - Display user account information
- 6.2 Track Applications - Monitor submission status
- 6.3 View Status - Present application progress

7. Adoption Applications Process: *(Planned)*

- 7.1 Submit Application - Capture adoption requests
- 7.2 Validate Application - Verify application completeness
- 7.3 Store Application - Persist adoption data

Purpose:

Level 1 DFD provides detailed understanding of process functionality and internal workflows.

DFD Hierarchy Summary

Level 0 - Context Diagram

- System-wide perspective
- Major functional areas
- External entity interactions
- Suitable for stakeholder communication

Level 1 - Functional Decomposition

- Process-level detail
 - Internal workflow representation
 - Sub-process identification
 - Suitable for technical implementation
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Data Flow Analysis

Level 0 Data Flows:

Public User Interactions:

- **Public User** → **Browse Dogs** - Access to dog catalog functionality
- **Public User** → **Authentication** - Registration and login processes
- **Browse Dogs** ↔ **Dogs Database** - Retrieval of dog information
- **Authentication** ↔ **Users Database** - User credential management

Registered User Interactions:

- **Registered User** → **Rescue Reports** - Submission of found dog reports
- **Registered User** → **User Dashboard** - Application status monitoring
- **Registered User** → **Adoption Applications** *(Planned)* - Pet adoption requests
- **Rescue Reports** → **Rescue Database** - Storage of rescue submissions
- **User Dashboard** ↔ **Multiple Databases** - Consolidated user data access

Administrator Interactions:

- **Administrator** → **Admin Panel** - System management interface access
- **Admin Panel** ↔ **All Databases** - Comprehensive data management operations

Level 1 Data Flows:

Browse Dogs Process (1.x):

- **1.1 Display List** - Retrieval and presentation of available dogs
- **1.2 Filter Dogs** - Application of search criteria and filtering logic
- **1.3 View Details** - Detailed dog information presentation

Authentication Process (2.x):

- **2.1 Registration** - New user account creation and validation
- **2.2 Login** - Credential verification and session establishment
- **2.3 Token Validation** - Session authenticity verification

Rescue Reports Process (3.x):

- **3.1 Submit Form** - Capture of found dog information
- **3.2 Validate** - Data validation and completeness verification
- **3.3 Store Data** - Persistence of validated rescue submissions

Admin Panel Process (5.x):

- **5.1 Manage Dogs** - CRUD operations for dog records
- **5.2 Review Rescues** - Processing and status updates for rescue submissions
- **5.3 Manage Volunteers** - Volunteer application processing
- **5.4 System Reports** - Generation of operational and analytical reports

User Dashboard Process (6.x):

- **6.1 View Profile** - User account information display
- **6.2 Track Applications** - Application status monitoring and updates
- **6.3 View Status** - Progress tracking for user submissions

Adoption Process (7.x) *(Planned)*:

- **7.1 Submit Application** - Adoption request form processing
- **7.2 Validate Application** - Application data verification
- **7.3 Store Application** - Persistence of adoption requests

Reference Summary

Level	Scope	Detail Level	Primary Audience
0	System Context	High-level Overview	Stakeholders, Project Management
1	Process Decomposition	Functional Detail	Development Team, System Analysts

The dog rescue system DFDs demonstrate a structured, well-architected application with clear functional boundaries and data flow patterns suitable for implementation and maintenance.