

# Expanded Glossary of XNAT Data Types and Class Relationships

## Hierarchy and Definitions of XNAT Data Types

1. Subjects: The primary entities in XNAT, representing individual participants or patients. Each subject may have

multiple associated experiments, making subjects the top-level data entity.

2. Experiments: Grouped under subjects, these entities represent specific study sessions or data acquisition episodes.

Experiments contain scans and resources, thus acting as the second level in the data hierarchy.

3. Scans: Encapsulate individual imaging sessions within an experiment. Scans include the actual imaging data files,

such as DICOM images, and associated metadata.

4. Resources: Represent supplementary data files linked to experiments or scans, such as reports or additional analyses,

adding flexibility to store varied data.

## Key Class Summaries and Their Relationships

### **ExperimentData (from `xnat_experiment_data.py`)**

Purpose: Manages metadata and data associated with experiments in XNAT.

Relationships:

- Interacts with: The ScanData and ResourceData classes to organize data files within a specific experimental context.
- Utility Dependence: Leverages utility functions for data formatting and validation from utilities.py.

### **ScanData (from xnat\_scan\_data.py)**

Purpose: Handles the organization, processing, and storage of scan-related data, including methods for adding new scans and updating metadata.

Relationships:

- Interacts with: Primarily used within ExperimentData for managing individual scan sessions.
- Subclasses: Includes ArthroDiagnosticImage and ArthroVideo, both inheriting from ScanFile, which represent specific scan data types (images and videos) for diagnostic purposes.
- Data Dependency: Each scan type may reference the intake form and metadata managed by MetaTables.

### **ResourceData (from xnat\_resource\_data.py)**

Purpose: Stores and manages supplementary data (e.g., reports or additional analysis files) related to a scan or experiment.

Relationships:

- Used by: The ExperimentData and ScanData classes when they require associated resources.
- Parent Class: ResourceFile, which provides methods to initialize and structure metadata related to

resources, further

allowing integration with other XNAT data types.

### **ORDataIntakeForm (from xnat\_resource\_data.py)**

Purpose: Captures metadata immediately after surgical procedures, which is essential for initializing ExperimentData and ScanData.

Relationships:

- Interacts with: MetaTables and XNATLogin to validate user data and ensure consistency.
- Parent Class: Inherits from ResourceFile, inheriting utility methods and attributes for metadata handling within XNAT.

### **MetaTables and XNATLogin (from utilities.py)**

Purpose: Provide shared utilities and validation mechanisms across classes for standardized data handling.

Relationships:

- Used by: Every major class (ExperimentData, ScanData, and ResourceData) to ensure that data handling follows specific protocols.
- Interoperability: MetaTables provides a mock database for handling metadata, essential for populating fields across subjects, experiments, and scans.

