XNAT Application Redesign

Functional Requirements Document

Last Updated June 11, 2012

Table of Contents

[Statement of Purpose 6](#_Toc327186466)

[Site Enhancement Goals 6](#_Toc327186467)

[01. Streamline Successful Execution of Users’ Tasks 6](#_Toc327186468)

[Common tasks + corresponding sections 6](#_Toc327186469)

[02. Support New Features 7](#_Toc327186470)

[Our toolset for achieving these goals: 7](#_Toc327186471)

[Technical and Integration Requirements 7](#_Toc327186472)

[General UX Enhancements 8](#_Toc327186473)

[Site Structure 8](#_Toc327186474)

[Basic data hierarchy 8](#_Toc327186475)

[Site Layout 8](#_Toc327186476)

[Navigation 9](#_Toc327186477)

[Site Header 9](#_Toc327186478)

[Logo for the instance of XNAT 9](#_Toc327186479)

[Icon Links 9](#_Toc327186480)

[Action Links 11](#_Toc327186481)

[Search Features 12](#_Toc327186482)

[User Settings 13](#_Toc327186483)

[Help *(Out of Scope)* 13](#_Toc327186484)

[Breadcrumbs 13](#_Toc327186485)

[Search Results 14](#_Toc327186486)

[Data Tables 14](#_Toc327186487)

[Terminology: 15](#_Toc327186488)

[Common Features of Data Table UI 15](#_Toc327186489)

[Components 15](#_Toc327186490)

[Build a Data Table page 16](#_Toc327186491)

[Step 1: Select Pivot 17](#_Toc327186492)

[Step 2: Define Table 17](#_Toc327186493)

[Step 3: Create this Table 19](#_Toc327186494)

[My Data Tables page 20](#_Toc327186495)

[Shared Data Tables 20](#_Toc327186496)

[Data Table vs. Table 21](#_Toc327186497)

[Data Table Viewer (when maximized) 21](#_Toc327186498)

[Form Improvements 21](#_Toc327186499)

[Modules and Widgetization 21](#_Toc327186500)

[Glossary 21](#_Toc327186501)

[Modules 21](#_Toc327186502)

[Widgets 22](#_Toc327186503)

[Dashboard 22](#_Toc327186504)

[Report Page 22](#_Toc327186505)

[As a development framework 22](#_Toc327186506)

[Widget UI Parameters 22](#_Toc327186507)

[Impact on User Interface 22](#_Toc327186508)

[Features of the Widgetized UI 23](#_Toc327186509)

[Maximized View 23](#_Toc327186510)

[Full Screen View 23](#_Toc327186511)

[Global User Dashboard 23](#_Toc327186512)

[Default Dashboard 23](#_Toc327186513)

[Quick links widget 24](#_Toc327186514)

[System Alert 24](#_Toc327186515)

[Project Alerts widget 24](#_Toc327186516)

[Projects You Recently AccesseD 25](#_Toc327186517)

[Did You Know? 25](#_Toc327186518)

[Data Summary widget *(global dashboard)* 25](#_Toc327186519)

[Recent Data Activity (global) 25](#_Toc327186520)

[Common Widgets 26](#_Toc327186521)

[Recent Activity widget 26](#_Toc327186522)

[“Actions for…” widget 27](#_Toc327186523)

[Details and Additional Details 28](#_Toc327186524)

[Data Summary 28](#_Toc327186525)

[Data Tables 29](#_Toc327186526)

[“Report” Pages 29](#_Toc327186527)

[Command Ribbon (shared feature of Report pages) 29](#_Toc327186528)

[Project Detail 30](#_Toc327186529)

[Command Ribbon (Project) - Unique Actions on this Command Ribbon: 31](#_Toc327186530)

[Project Owner Command Ribbon 31](#_Toc327186531)

[Main Content Widgets 31](#_Toc327186532)

[Sidebar Widgets 32](#_Toc327186533)

[Subject Detail 32](#_Toc327186534)

[Command Ribbon (Subject) 32](#_Toc327186535)

[Main Content Widgets 32](#_Toc327186536)

[Sidebar Widgets 33](#_Toc327186537)

[Visit Detail 33](#_Toc327186538)

[Command Ribbon *(Visit)* 34](#_Toc327186539)

[Main Content Widgets 34](#_Toc327186540)

[Sidebar Widgets 34](#_Toc327186541)

[Experiment Detail 34](#_Toc327186542)

[Command Ribbon *(Experiment)* 34](#_Toc327186543)

[Main Content Widgets 34](#_Toc327186544)

[Sidebar Widgets 34](#_Toc327186545)

[Image Session Detail 34](#_Toc327186546)

[Command Ribbon *(Image Session)* 34](#_Toc327186547)

[Main Content Widgets 35](#_Toc327186548)

[Sidebar widgets 37](#_Toc327186549)

[Project Configuration 37](#_Toc327186550)

[General Settings 38](#_Toc327186551)

[Users 38](#_Toc327186552)

[Data Configuration 38](#_Toc327186553)

[Pipelines 38](#_Toc327186554)

[Utilities *(out of scope)* 39](#_Toc327186555)

[Data Configuration 39](#_Toc327186556)

[Create New Project 40](#_Toc327186557)

[01. Basic Project Information 40](#_Toc327186558)

[02. Data Configuration: Does this project use a “Visit” structure? 41](#_Toc327186559)

[03(a). Data Configuration – “Yes, help me set up Visits for this project” 41](#_Toc327186560)

[Data Configuration – “No, this project does not use Visits” 42](#_Toc327186561)

[Visit Sequence 42](#_Toc327186562)

[other ways that visit impacts the ui 43](#_Toc327186563)

[Users 43](#_Toc327186564)

[Terminology: Invite vs Add 43](#_Toc327186565)

[Current Project Users Table 44](#_Toc327186566)

[Invite by Email 44](#_Toc327186567)

[Add Existing XNAT Users 45](#_Toc327186568)

[Pool 45](#_Toc327186569)

[Selected – named “users to add to this project” 45](#_Toc327186570)

[Issues Framework 46](#_Toc327186571)

[Discrepancies 46](#_Toc327186572)

[Discrepancy Manager 47](#_Toc327186573)

[Discrepancy Detail page 48](#_Toc327186574)

[Tasks 49](#_Toc327186575)

[Task Manager 49](#_Toc327186576)

[Task Detail page 50](#_Toc327186577)

[Prearchive 51](#_Toc327186578)

[In the Site Navigation 51](#_Toc327186579)

[Prearchive page 51](#_Toc327186580)

[Filters 51](#_Toc327186581)

[Sessions 52](#_Toc327186582)

[Details 53](#_Toc327186583)

[Archive Image Session 53](#_Toc327186584)

[Other Pages 53](#_Toc327186585)

[“More Actions” 53](#_Toc327186586)

[Account Settings 54](#_Toc327186587)

[Login 54](#_Toc327186588)

[Page Components 54](#_Toc327186589)

[Register 55](#_Toc327186590)

[Register with Project Invitation email 55](#_Toc327186591)

[Other Features 55](#_Toc327186592)

[Communication 55](#_Toc327186593)

[Notifications 56](#_Toc327186594)

[Help and Training (Out of Scope) 57](#_Toc327186595)

[Deployment Requirements 57](#_Toc327186596)

[Help Features 57](#_Toc327186597)

[Reports (Out of Scope) 57](#_Toc327186598)

[Download Images (Out of Scope) 57](#_Toc327186599)

[Upload Images (Out of Scope) 57](#_Toc327186600)

[Image Viewer (Out of Scope) 57](#_Toc327186601)

[File Manager (Out of Scope) 57](#_Toc327186602)

# Statement of Purpose

The purpose of this Functional Requirements Document (FRD) is to aggregate the functionality and enhancements of the XNAT platform that Integrity recommends as part of the GUI redesign. These recommendations and specifications are based on the cumulative feedback we have gathered through the discovery phase and usability audit, the wireframe iterations, and the feedback we received from the NRG.

The FRD is supplemented with the following documents and together encompasses Integrity’s recommendations:

1. XNAT User Interface Guidelines for Form Elements (delivered at a later date)
2. XNAT User Interface Style Guide (delivered at a later date)

# Site Enhancement Goals

## 01. Streamline Successful Execution of Users’ Tasks

The primary project goal is to enhance the experience for XNAT by addressing issues of **efficiency**, **organization**, **clarity**, and **consistency**.

### Common tasks + corresponding sections

* **Locate Data**
  + Navigation
  + Search
  + Data Tables
* **Data Mining**
  + General UX Enhancements (also see separate “XNAT User Interface Style Guide” document)
  + Search
  + Data Tables
  + Reports (determined to be Out-of-Scope)
* **Data Entry**
  + **Create Data Object**
  + Upload “via Spreadsheet”
  + **Form UI Enhancements (See “XNAT User Interface Guidelines for Form Elements” document and “XNAT User Interface Style Guide”)**
  + Prearchive
  + Archive Image Session
  + **Image Upload** (determined to be Out-of-Scope)
* **Data Processing**
  + Execute Pipeline
* **Project Setup**
  + Project Configuration
  + Users/Access Permission
* **Project Management**
  + **Documents**
  + Task Manager
  + Discrepancy Manager
  + Lock Data Object
  + “Overview” and “Summary” widgets
* **File Management** 
  + **File Manager** (determined to be Out-of-Scope)
* **Download Images** (determined to be Out-of-Scope)
* Quality Control
  + Data Configuration
  + Discrepancy Manager
* Site Administration (determined to be Out-of-Scope)

## 02. Support New Features

* Site-wide System Notifications (e.g. alert when maintenance is being performed on servers, etc)
* Email Notifications
* Issues Platform (“Notifications,” “Tasks”)
* Locking Data Objects
* Visits Structure (links to “Project Configuration”)
* User Customization of Dashboard pages
* A design that accommodates a modular development framework (extensibility)
* Help sections and contextual help throughout application
* See **“Appendix B: Features Out-of-Scope”** for features that were discussed during discovery but are not within the scope of this redesign.

## Our toolset for achieving these goals:

* **Information architecture**, with focus on improving navigation and site structure, simplifying page content, and re-organizing complex workflows in a more intuitive manner.
* **Consistency** in design and system behavior.
* Update the XNAT platform with **modern, well-supported design conventions** that remove points of frustration in the existing design and simplify the user’s experience. Specific points of these site-wide UX enhancements are expanded on in greater detail in the section titled **“General UX Enhancements”** and in the related document **“Forms UI Recommendation.”**

# **Technical and Integration Requirements**

* **In terms of final delivered assets, Integrity will approach integrating with the XNAT API on a per-page basis, determined by how much of the API and feature set has already been built by the NRG and is available for Integrity’s developers.**
* **Integrity will be developing front end assets using HTML, CSS, and JavaScript. Integrity developers will integrate with the XNAT system through a combination of the Rest API and Velocity templating language, which can access existing XNAT Java classes for data.**
* **Hosted on NRG’s server (existing XNAT.org server)**
* **Cross-browser tested for the following browsers:**
  + Safari S5
  + Chrome 16 & 17
  + Firefox 9 & 10
  + Internet Explorer 8 & 9

# **General UX Enhancements**

* Improve speed and responsiveness of the application (NRG is responsible)
* Highlight available features
* Elevate appropriate content and actions on each page, according to common tasks
* Add progress graphics where necessary
* Ensure consistency and accuracy of language/labeling of information within the app
* Consistency of design components and layout
* Reduce number of ways a user can accomplish a single task
* Format of Date and Time (application wide): **YYYY-MM-DD, HH:MM:SS**

# Site Structure

### Basic data hierarchy

* XNAT Instance > Project > Subject > Visit > Experiment > Assessment

### Site Layout

Application will be built on a three column layout. All Report-type pages adhere strictly to the three column-layout, while Action pages will have more flexibility (Read “User Customization” for more information on distinction between Report and Action pages).

For more information on Maximized layout view, go to “User Customization” in this document.

# **Navigation**

## **Site Header**

**Purpose:** To elevate operations that have been identified as common tasks, to initiate actions through a “Global” lens (rather than within the scope of a project), to advertise features identified by the NRG as needing more adoption.

**Miscellaneous Features**

1. “Fixed” positioning – the site-wide “toolbar” will travel with the user down the page when the page is scrolled
2. Constrained width and maximized width variations – for certain pages on XNAT, there will be a “Maximized” view (i.e. “Data Table Viewer”), and the site header will adjust to fill up the full width of the screen.

The site header includes the following components:

### Logo for the instance of XNAT

On Click: Return to the “Home” aka Global User Dashboard

### Icon Links

This area of the header represents links to actionable data

**Common Features**

* 1. For My Projects, My Data Tables, and My Reports, which are intended to be comprehensive lists of the associated data, there is an AutoComplete box for quickly finding a specific item in a list.
  2. If there is a “Create” action associated with the feature, it will be displayed as a right-aligned button in the header area of the dropdown menu:
     1. **My Projects** – “Create New Project”
     2. **My Data Tables** – “Build a Data Table”
     3. **My Reports** – “Create a Report” (Out of Scope)
     4. **My Task List** – no associated create task at the global level
     5. **Prearchive** – no associated create task at the global level
  3. The bottom of the dropdown list is a large button that allows the user to “manage” or “go to” a full list of the items in that dropdown. The exception is My Projects, since this drop already shows all projects in the menu.

**The items in this menu include:**

#### My Projects

Dropdown menu displays comprehensive list of all the projects the user has access to (with scroll bar). They are organized by the most recently accessed at the top.

There is a “Create New Project” button. There is no “See all projects” page or action.

Each card in the list will include the following parameters:

1. Project Title
2. First line of the description

Other features

* **On click** of an item in this list, the user will be taken to the Project Detail page

#### My Data Tables

Dropdown menu displays the 8 most recently accessed Data Tables. There is a “Build a Data Table” button at the top; at the bottom is the “Manage Data Tables” button that takes the user to the “My Data Tables” page.

Each card in the list will have the following parameters:

1. Data Table Name
2. Date Last Updated

Other features

* **On click** of an item in this list, the user will be taken to the “Data Table Viewer” page.
* Button on the bottom of the dropdown menu reads “Manage Data Tables” and on click takes user to the “My Data Tables” page

#### My Reports

Dropdown menu displays the 8 most recently accessed Data Tables. There is a “Build a Report” button at the top; at the bottom is the “Manage Reports” button that takes the user to the “My Reports” page. (Out of Scope)

Each card in the list will have the following parameters:

1. Report Name
2. Date Last Updated

Other features

* **On click** of an item in this list, the user will be taken to the “Report Detail” page (Out of Scope)
* Button on the bottom of the dropdown menu reads “Manage Reports” and on click takes user to the “My Reports” page (Out of Scope)

#### My Task List

Dropdown menu displays the 8 most recently added Tasks. At the bottom is the “Manage Tasks” button that thakes the user to the “Task Manager” page.

Each card in the list will have the following parameters:

1. Status (see Issues Platform: Tasks for a full list of statuses)
2. Priority (see Issues Platform: Tasks for a full list of priority settings)
3. Time Added
4. Data (the data object being flagged by this task, formatted in same method as Breadcrumbs, but with no dropdowns. Each level is clickable to let the user navigate to that Data Object)
5. Task Title
6. Description (3 lines of description that gets truncated by a …)

Other Features:

* **Notification icon**, similar to notification icon for Facebook on the “Message Center” and the “Notifications” sections, an icon and a number will indicate when something requires the user’s attention.
* **On hover** over each card, an icon will appear in the top-right which, when clicked, takes the user to the “Tasks Detail” view in the Task Manager
* **On click** of the card, the user is taken to the Data Object assigned the task

#### Prearchive

Dropdown menu displays the 8 Prearchive items with the most recent activity. At the bottom is the “Go to Prearchive” button that takes the user to the “Prearchive” page.

Each card in the list will include the following parameters:

1. Time Added
2. Scan Time
3. Session ID
4. Status (See “Prearchive” section for full list of possible statuses). This list will only show entries that have statuses of “READY”, “ERROR,” or “RECEIVING”

Other Features:

* **Notification icon**, similar to notification icon for Facebook on the “Message Center” and the “Notifications” sections, an icon and a number will indicate when something requires the user’s attention.
* **On click** of the card, the user is taken to the Archive Session Detail page.
* Button on the bottom of the dropdown menu reads “Go To Prearchive” and on click takes user to the Prearchive page.

### Action Links

Organized into dropdown menus.

These menus will be able to accept customization through XNAT modules set up by the instance’s site administrator. The design will need to be flexible and allow for additions to this menu.

**Other notes**

* + The design of the dropdown menu will need to distinguish “officially supported” menu items from ones added by a third party module.
  + Need to establish a threshold for the number of items allowed within the dropdown menus.

**The dropdown menus are:**

#### “Create”

The items in this menu will each also have the icon associated with each level of the data hierarchy next to it, to further familiarize the user with the icon conventions the design seeks to establish.

The items in this menu include:

1. New Project
2. New Subject
3. New Visit
4. New Experiment
5. New MR Session

#### “Upload”

1. Images – launches Java Image Uploader in a new window (Out of Scope)
2. Data via Spreadsheet

#### “Manage”

By default, the “Manage” dropdown is only visible for Site Administrators. However, a module activated for an instance of XNAT can be allowed to insert a link into this menu, in which case it may become visible to the general XNAT user.

The items in this menu include: (Out of Scope)

1. Users
2. Data Types
3. Email
4. Default Settings
5. Pipelines
6. Upload Data via XML

#### “More” (represented as “»”)

Logically, this is where miscellaneous links can be inserted by modules that otherwise need a place to “live” in the GUI. The “More” dropdown menu will always include the link “More Actions,” which brings the user to the **“**More Actions**”** page.

* This **“**More Actions**”** page aggregates all the possible actions that are available on that instance of XNAT, default and third party.

### Search Features

#### Basic Search, or “Find”

Defaults to search for ID or label through ALL datatypes in the system that the user has access to.

Dropdown within Search Box is expanded on click to let the user choose the “level”within the data structure to search on. These levels are:

1. Projects
2. Subjects
3. Visits
4. Experiments
5. Assessments

Hitting “Enter” within the search field, runs the Search.

If the Search returns a single match, the user is taken directly to that Data Object’s page. If the Search returns multiple results, the user is taken to the “Search Results” page.

#### Advanced Search

Links to the “Build a Data Table” page.

\*Note: Eventually, once the users have been trained on the new role of “Build a Data Table,” the “Advanced Search” option could be removed completely.

### User Settings

The user account is represented as a button dropdown labeled with the user’s username. Will truncate the username and add ellipsis after a certain length. Hovering over the element will cause the username to scroll within the button to display the full name.

**The items in this menu include:**

* Account Settings
* Log Out

### Help (Out of Scope)

Icon dropdown menu.

**The items in this menu include:**

#### Report a Problem

Open “Report a Problem” modal

#### Open Help Center

Opens link in a new window to the XNAT centralized “Help Center”

# Breadcrumbs

**Overview**

Each entry after the Project is represented as a dropdown. The dropdown will open to display a list of all instances of that data level, refined by the preceding data structure. For example, if the user is on an MR Session page and clicks on the dropdown arrow of the MR Session breadcrumb, the dropdown list would display all sibling Experiments that belong to the same Subject.

**Features of the dropdown**

* Clicking on the arrow on the right side of the element opens the dropdown
* Clicking on the body of the dropdown will take user to the page it describes (the distinction between the two click areas will be made clear with a vertical line separating the arrow from the rest of the dropdown)
* An Auto-Filter box will allow the user to search/filter the list of sibling data objects
* There will be an “onstate” for the item in the list that corresponds to the current navigation trail

**Other notes**

The first item in the sequence will belong to the Project. This link is clickable and takes the user back to the Project page, but is NOT a dropdown menu (essentially functioning as a regular breadcrumb link).

For **report type pages**, the breadcrumbs will reflect the data structure of XNAT and, specifically, the structure within that project.

For **action pages**, there are a couple scenarios:

* If the action page stems directly off of a report page, the breadcrumbs will additionally add the name of the action page as the final entry (for example, “Edit Details” for any data object will show the entire breadcrumb + “Edit [Data Object] Details”).
* If an action page is coming off of another action page (for example, the “Edit Scope” page of an “Edit Details” page, or the “Create New Visit Template” page of Data Configuration), the breadcrumbs will be removed entirely. The user will need to return to a first-level action page via a “Back” link before seeing the breadcrumbs again.
* “Create New Project” and “Project Configuration” are in the unique position of being within a project context but without any subsequent data levels. The breadcrumbs should read “You are in [Lorem Ipsum Dolor] Project.” The breadcrumb, in this case, is NOT clickable, as there is no project to take the user to yet.

For some pages that exist **outside of the XNAT data structure** (e.g. Task Manager, Discrepancy Manager, My Data Tables), the root of the breadcrumbs becomes those pages (e.g. Discrepancy Manager, My Data Tables). This allows those workflows to take advantage of a breadcrumb structure within those sections (for example, this allows the user to quickly toggle between different saved data tables from the Saved Data Table detail page).

* The Discrepancy Manager is unique in that the breadcrumbs UI is recycled to allow the user to change the project scope of the Discrepancy Manager. This is especially useful because the Discrepancy Manager is only accessible through the lens of a project and cannot be accessed directly from the site navigation.

# Search Results

The Search Results page only appears when the algorithm that governs the “ID/Label” search in the site navigation does not return a single result.

The results items are displayed in a card-view list, stratified by datatype. Results for “Projects,” “Subjects,” “Visits,” “MR Sessions,” “PET Sessions,” and “CT Sessions” are displayed first (in that order, assuming that there are results for those datatypes).. Any results that follow are displayed in alphabetical order by the name of the datatype.

Each card in the Search Results will display the following:

* ID/Label
* Date Created
* Date Modified
* Project (not required for Project results)

Each datatype grouping will have a “results” text, indicating the number of matching items found.

The Search Results will also highlight a “Build a Data Table” link to encourage traffic to the more powerful search features that the Data Table offers.

# Data Tables

In its most basic form, a Data Table is literally a table of data. The characteristics that make a Data Table unique from other tables used within XNAT (e.g. Visits and Experiments table on the Subject page) are:

1. Advanced sorting and filtering options to curate table data
2. Ability to share with other users
3. Increased capacity to handle vast amounts of data
4. Unique use cases targeted toward reporting and project management. For example:
   1. Create a dataset filtered by multiple parameters for report generation
   2. Create a work list (affects the implementation of “Sharing”)
5. “Pivot” – Data Tables require that there be a “pivot” datatype that dictates what the values within each row of the table are related to. The pivot will satisfy the requirement that each instance of the datatype is represented by a unique row in the table (multiple rows cannot exist for the same instance of the pivot). All other datatypes and their attributes will be joined to this “pivot.” Additional information about pivot datatypes is discussed in the section “Build a Data Table.”

## Terminology:

* **“Build”** will be used in place of the verb “Create” when it comes to Data Tables
* **“Pivot”** refers to the datatype that satisfies this statement when the table is generated: “For each instance of this datatype, there exists exactly one row in this table.”
  + After significant deliberation, a decision was reached to openly refer to “Pivot” in the user interface, in order to teach users to internalize the term when it comes to building data tables.
* A **“one-to-many”** situation refers to a scenario where more than one instance of a joined datatype matches a single instance of the pivot. Unless this situation is resolved, the Data Table will not be able to supply the values for the remaining attributes of the joined datatype for that row of the table.

## Common Features of Data Table UI

Also see “Data Table Viewer (maximized view)” for specifications of the Data Table widget when it is maximized.

### Components

#### Filter String

The Filter String includes the full text of the database query that was run to generate Data Table (using friendly filtering language). It will NOT be editable on this page. This Filter String text is also updated to reflect when filters and datatypes are added or removed.

There will be an “Edit Filters” link that takes the user to the “Edit Filters” modal where they can modify filters.

#### Toolbar

Located directly above the Data Table, this toolbar contains buttons for the following actions:

* Edit Table – Takes user to “Edit Table” page.
* Export (dropdown)
  + As Spreadsheet (CSV)
  + As XML
* Share
  + Will bring up “Share Data Table” modal
    - User must provide list of usernames or email addresses to share the data table with
* “Save to My Data Tables” (only available when the Data Table has not yet been saved)
  + Opens a modal that prompts the user to provide a name (60 character or less)
  + If the Data Table has already been saved to My Data Tables, this button will read “Save” with a dropdown arrow that allows the user to “Save As…”, creating a copy of the Data Table. This prompts the “Save Data Table” modal where the user can create a name for the saved Data Table.
* More Actions dropdown (conditional) – becomes visible if third-party modules add actions to the “Data Table” toolbar.

#### Table

Basic navigation utilities (see column headers as well):

* Results (X rows)
* Pagination (Page X of Y)
* Showing rows per page (dropdown that defaults to 25; always has option for “All rows”)
* Edit (except on a Data Table the user did not create)
* Share (except on a Data Table the user did not create)
* Save (on first instance, is “Save to My Data Tables;” on subsequent, it is “Save” or “Save As…”)

#### Column Headers

Column headers will follow the users as they scroll down the page.

All columns will be sorted according to the left-most column (pivot datatype) either alphabetically (A-Z) for character fields or smallest to largest for numeric fields.

**Left clicking on a column header brings up a menu with the following options:**

1. Sort Up
2. Sort Down
3. Remove Column – brings up confirmation modal
4. Add Filters to this Column – Brings up “Filter Column” modal
5. Rename Column – allows user to rename header in-line

Some columns are also designated as “Counts” columns (named as “[Datatype Name] Matches”), which display the number of matches of a joined datatype to each row of the pivot datatype. These columns will have an additional “Set up Rules” action and indicator if a “one-to-many” situation exists. See “Step 3: Create this Table” for more detail.

Note: There is a use case for being able to arrange the ID column for a joined datatype to someplace other than at the front of the table (necessary in the current incarnation so that the user may resolve any existing “one-to-many” situations), which accounts for the column name change from simply “Counts.”

#### Miscellaneous Features

See Project Data, a widget on the Project Detail page, for a variation of the Data Table.

## Build a Data Table page

“Build a Data Table” can be accessed via the “Data Tables” icon navigation dropdown and also from the “My Data Tables” page.

“Build a Data Table” functionality replaces the “Advanced Search” of XNAT 1.6 (and earlier).

* Improvements that the proposed Data Table framework offers over the existing Advanced Search functionality are:
  + User gains granular control over the columns that will be included in the generated table BEFORE the query is run
  + Removes ambiguity regarding the columns that are available in the “Brief” and “Detailed” column sets for a “joined” datatype
  + Removes ambiguity regarding how “one-to-many” scenarios are resolved
  + User interface is same between editing a generated table and creating a table – made possible by compartmentalization of “Filtering,” “Rename Column Label” and other actions
  + Addition of a “Preview” of the Data Table while it is being constructed
  + Allows “Filters” to be set up on columns before the query is run
  + Intuitive drag and drop interaction for user to rearrange columns
  + Addition of in-line “Rename Column” functionality
  + Improved “Sharing” options

This feature is one of the more complex operations of XNAT 2.0. However, one of the goals of the redesign is also to increase adoption of this tool in Search and Reporting operations. To this end, a number of Help features are exposed directly on the page.

* “What are Data Tables?” help box on the first step that describes common uses for this tool in a bulleted list. Will also link to the “Data Tables” section in the XNAT Help Center.
* “Quick Filters” box on Step 2 that offers common filters XNAT users have used in the past when generating searches/tables. Known quick filters include:
  + “Import a list of Subjects to constrain table results” - Will open a modal containing a TEXTAREA that accepts comma or whitespace delimited list of subjects

When the user initially reaches this page, all fields except for “Step 1: Select Pivot” are greyed out.

### Step 1: Select Pivot

User must provide Pivot datatype using the AutoComplete dropdown.

**Once the pivot has been selected:**

* Step 2 and 3 are activated.
* A default set of columns defined for the selected pivot datatype (will be defined at the schema level) are automatically added to the “Selected” column of Step 2 (the “Selected” column is named “Columns to Display”).

### Step 2: Define Table

In the movement from Step 1 to 2, if the user has chosen as the pivot a datatype that has a “Brief” set of columns defined within its schema, these columns will automatically be added to the “Selected” section.

See “Curated List” design pattern in the “Form UI Guidelines” document for interactions defined in this UI design pattern.

**Terminology: “Load” vs. “Add”** – Load is always used to describe adding to the “Pool,” while “Add” refers to moving items from the “Pool” to the “Selected” column.

#### “Pool”

The “Pool” contains a list of columns for the pivot and “joined” datatypes that have not yet been added to the list of columns to be queried in the Data Table.

* The user will be able to load a Datatype (also called “join”) to be cross referenced with the pivot, by using the **“Load Datatype”** action box.
  + This UI uses an AutoComplete dropdown for the user to select the desired datatype to load.
  + Hitting “Load” populates the Pool with all columns defined for the loaded datatype.
    - In instances where a default set of columns has been defined for the loaded datatype, these default columns will be added directly to the “Selected” section and only those remaining will appear in the “Pool”.
* The loaded columns will be organized by datatype in Accordion Lists
* The header of each Accordion List will contain a “Select All” link
* The list of loaded columns can be filtered with a “Search…” AutoComplete element
  + Filters the list of available items in the Pool (does not have a separate “Suggestion Box”).

#### “Selected”

The “Selected” box contains all the data needed to generate the Data Table. This includes the columns and their order, indication of the pivot datatype, any active filters that have been applied at the column level, and any column labels that have been edited. Ideally, it will be the one place a user must scan through in order to identify all parameters that make up the Data Table being created.

* This section will be populated with a curated list of columns when a datatype is selected as the pivot AND when a datatype is joined to the current selection (this will replace the current “Brief” vs. “Detailed” framework)
* Items added to this column are manifested as “Blocks” with the following features:
  + Each block will be divided into three columns: 1) an implied column representing the “draggable” area of the block, 2) “Datatype” (the datatype the column originally belonged to, necessary because of repeated column labels), and 3) “Column Label”
  + These blocks can be rearranged with Drag and Drop.
* **“Filter Column” modal**
  + A “Filter” button appears when the user mouses over a Block
  + Choosing to “Filter” brings up the “Filter Column” modal
  + NOTE: “Filter”-ing at the “Build a Data Table” step does not give the user the benefits of prepopulated values for that column.
  + NOTE: This modal is recycled outside of the “Build a Data Table” page for when the user is making edits directly on the executed table. This modal will have the advantage of loading possible values in a dropdown when the user is defining the filter parameter.
  + The modal allows users to select a logical operator (listed below) and supply possible values to filter on (an operator-value set is called a “**Parameter**”).
  + Users can create multiple parameters for a column filter (CANNOT create nesting parameters) by clicking on the “+Add Parameter” text link. Multiple parameters can also be joined using a logical operator (listed below)
  + **Operators for defining a parameter** (in parentheses, SQL equivalent):
    - Equals (=, IN)
    - Does Not Equal (NOT)
    - Contains (LIKE)
    - Does Not Contain (NOT LIKE)
    - Is Empty (IS NULL)
    - Less Than (<=)
    - Greater Than (>=)
    - Between (BETWEEN)
      * If this is selected, the single input field becomes two so the user can enter a minimum and maximum value
  + **Operators to join parameters:**
    - OR (will be set to this by default)
    - AND
  + “Apply Filters” button closes the “Filter Modal” and updates the “Selected” column so that the parameter filter text is displayed in small text within the Block for the filtered column.
    - Will also add a “Clear Filters” link to the UI of a filtered column’s Block.
* **“Rename Column”** 
  + An “Edit” icon (a pencil) appears next to the Column Label value when the user mouses over a Block.
  + Clicking it allows user to edit Column Label in line. Hitting Enter commits the changes.

#### “Preview this table” button

* Opens a modal that displays three rows of the Data Table given the parameters currently defined in the “Selected” section of Step 2.
  + i.e. Will render all columns defined in the “Selected” area and apply all filters and edited column labels
* Note: The performance benefits that “Preview” would allow may not be as significant as initially imagined (per Tim’s feedback), but DECIDED to keep functionality in favor of giving the users the illusion of control and whatever performance benefits the Preview does offer.

#### Quick filters

Also referred to in description of goals of the “Build a Data Table” page. Known Quick Filters are:

1. Filter [pivot] by list of Subjects

### Step 3: Create this Table

Shares the Common UI Features of all Data Tables

#### Resolve “One-to-many” conflict

Data Tables that have joined at least one datatype to the pivot will have a set of “Count” columns labeled with the following convention: “[Joined Datatype Name] Matches.” These columns will also appear in the first “window” of the table, i.e. visible without horizontal scrolling.

The purpose of the “Count” column is to display the number of matching instances of a joined datatype for each row of the pivot. If there are any conflicts in that column, that column header will receive a small graphic indication that resolution of a “one-to-many” conflict is necessary.

**“Set up rule for joined Datatype” modal**

* The modal will offer explanation for why
* The modal will offer the user the ability to “flip the table” by clicking on a link that automatically switches the datatype in question with the pivot datatype (e.g. “Click Here to set Freesurfers as the pivot:)
  + A common way for tables to circumvent “one-to-many” scenarios is to select a different datatype as the pivot.
* Alternatively, the modal allows the user to select one of the following rules to set for the datatype, which will ensure a unique object for each instance of the pivot.
  + Proximity of Date (recommended)
  + Newest
  + Oldest
  + Custom (for NRG to define)
* If the user sets a rule for the join, the graphic indicator on the “Count” column header will remain (but change to a different color to indicate the “one-to-many” conflict has been resolved), and all rows within the count column that change to “1” as a result of setting up the rule will receive a graphic indicator as well (noted in the wireframe as an asterisk).

## My Data Tables page

This page will feature two tabs, “Created By Me” and “Shared with Me.” Differences in the list are outlined below in the section “Shared Data Tables.”

Navigation features of My Saved Tables page:

* Sort By
  + Alphabetical
  + Date Created
  + Date Modified
* “Build a Data Table” button – takes the user to the Build a Data Table button

Each Data Table card in the list will display the following attributes:

1. Name of Saved Table
2. Date Created (date/time stamp)
3. Date Last Modified (date/time stamp)
4. Data Summary (based on last time run, which includes row count of pivot datatype and what it was joined to; e.g. “416 MR Sessions, joined to Freesurfer, Rad Reads)

Clicking on an entry in the list takes the user to the “Data Table” detail page for that item.

Hovering over an entry displays the following possible actions for the user to take from this page:

1. Edit – opens “Edit Table” page
2. Share – opens “Share Table” modal
3. Delete – opens confirmation modal

### Shared Data Tables

Data Tables will only appear in the “Shared with Me” tab of the “My Data Tables” page through the following process:

1. A user builds a Data Table and chooses to “Share” it with another user.
2. The system sends that user an email invitation with a link to the shared Data Table.
3. Clicking on the link adds the table to the user’s “Shared with Me” tab of the “My Data Tables” page
4. Only the original creator of the Data Table can edit it. Users cannot save over a shared Data Table. They can, however, use the “Save As…” action and essentially create a new Data Table from the shared one. This saved version will show up under their “Created by Me” tab. The original Data Table will not be modified.
5. From the “Shared by Others” tab, a user can “remove” a shared Data Table so it will no longer show up on their My Data Tables page. It does not, however, affect the original Data Table in any way.

#### Differences in UI components between a Shared Data Table and one that the user has full access to:

* “Edit Table” is not available in the toolbar of a shared Data Table
* “Share” is not available in the toolbar of a shared Data Table (users can only share Data Tables they created)

### Data Table vs. Table

Click here to see Specifications for Table (Common Widget).

A Table does not have filtering features on the Column level, though UI components separate from the table itself may interact with the Table to filter its contents. The columns for a table will be static. Columns can be sorted up and down but not filtered. Tables will generally handle a dataset that will not require horizontal scrolling.

## Data Table Viewer (when maximized)

Same UI elements as Data Table when not maximized (e.g. Filter String, Toolbar, Table, etc. Click Here for full specifications of Data Table UI).

See layout changes common to all “maximized” views of the application.

# Form Improvements

See related document **“Forms UI Recommendation”** for comprehensive recommendations for Form components. Summary of improvements:

* Better support for inline validation and immediate user feedback
* Form hinting, indications for required fields
* Use of appropriate form elements (e.g. dropdowns in place of text fields) to minimize the possibility of user error
* Success/failure messages upon taking an action
* Remove instances where there will be multiple submit buttons on one form
* Better visual grouping of like form fields for increased usability
* Standardization of field labels, font treatments, etc.

# **Modules and Widgetization**

XNAT 2.0 has been developed on a modular framework in order to encourage extensibility of the application. Widgetization has been introduced as a way to address the problem of a uniquely diverse set of user personas by allowing a degree of user customization on key pages.

## Glossary

### Modules

A module is a package of related code that describes a functional component of the XNAT platform. In terms of how the site is constructed, XNAT 2.0 will be built on a “modular architecture.” “Modular architecture” does NOT describe the visual presentation of information in the system. Instead, it describes how all processes and components of the backend are compartmentalized into discrete sets of code. A module can initiate or allow the display of a widget or multiple widgets or appear in various non-widget incarnations throughout the application.

### Widgets

A widget is a visual block of related data, generated through the code of a module. In the case of Dashboard areas, a widget will be immediately recognizable as a visual unit that can be moved around, rearranged and customized. The visual concept of widgets will also be particularly important as the primary visual presentation of third-party extensions to XNAT.

### Dashboard

A “dashboard” describes a page or area of a page where users are allowed to add, rearrange, resize and configure widgets.

### Report Page

A Report page is “a page whose primary role is to display an Object and all its related data.” Examples include the Project Detail page, Subject Detail page, MR Session Detail page, etc. Essentially, the detail page of any XNAT Data Object.

## As a development framework

The NRG would like to see each component of the XNAT application (default and third-party) compartmentalized into units called “Modules” (See definition above).

### Widget UI Parameters

The capabilities of a widget must be determined by the widget developer in the module.

1. Size of the widget (one column or two column)
2. Default height of the widget (min- and max- height)
3. Customizable parameters (“Configuration Options” for the widget)
4. Configurable – True/False
5. Maximize – True/False (See specifications)
6. Collapsible – True/False
7. Help – True/False + filepath

Widgets will receive a separate **Style Guide** document which contains our recommendations to third-party developers for how common UI elements should be formatted, to be delivered at the same time as the Style Guide for the rest of the GUI.

All “Report” pages are set up from the developer’s perspective in a widgetized structure. However, Report pages can be customized by the site admin on a per-project basis.

## Impact on User Interface

As stated above, the widgetized framework and layout will apply to **all Report pages**. A **“Report”** page is defined as “A page whose primary role is to display an Object and all its related data.” Examples include the Project Detail, Subject Detail, Visit Detail, MR Session Details pages, etc. However, the only page that users are allowed to rearrange and otherwise customize is their User Dashboard.

### Features of the Widgetized UI

* Three- column layout
* “Content” and “Sidebar” widgets
* On the Global User Dashboards (default and custom), the widgets will be moveable, with dropzones (dotted lines) to indicate possible placement
* The user can NOT drag a 2-column widget into a 1-column space, and vice versa
* The dashboard auto-saves every time a user rearranges or collapses/expands a widget, so the next time they open the dashboard those same modifications will be visible

### Maximized View

Widgets can be configured to allow users to maximize the component. This option should be reserved for widgets that would benefit from more screen real estate (tables and lists) in order to minimize saturation of this option.

#### Known Instances of maximized view in default XNAT widgets:

* Recent Activity widget (on all Report pages)
* Actions for “Lorem Ipsum Project” widget (on all Report pages)
* “Subject Data” table on **Subject Detail**
* “Visit Data” table on **Visit Detail**
* “Scans” table on **MR Session Detail**
* “Session Data” table on **MR Session Detail**
* “Your Saved Templates” on **Upload Data via Spreadsheet**
* “Sessions Uploaded to the Prearchive” table on **Prearchive**

### Full Screen View

For certain components (typically complex tables) that would benefit from a wide-screen view, there is an option to toggle to a full screen view. When this is toggled, the header, navigation and table spans across the entire screen.

#### Known Instances:

* All Data Tables, including:
  + Project Data
  + Subject Data
  + Visit Data
  + Task Manager
  + Discrepancy Manager
  + Data Table (Unsaved, Saved, Shared)

# Global User Dashboard

The Global User Dashboard refers to the “Home” screen a user will see upon logging in to XNAT. This Dashboard page is also the **ONLY** area of XNAT in which users can rearrange widgets on the page.

Integrity is defining the look and feel of a Default Dashboard.

## Default Dashboard

The default Dashboard will be the “Home” page of out-of-the-box deployments of XNAT when a user is logged in. The goals of the widgets selected for this default dashboard are:

1. Encourage interaction with project data by providing activity summaries.
   1. The user is not expected to be able to resolve any issues from the dashboard, but the widgets provide enough information for the user to navigate to those pages where action is possible.
2. Display active alerts at a system and project level, i.e. critical information that will impact the user’s interaction with the system and project.
3. Highlight commonly performed tasks and elevate features of the application which may otherwise be hidden from view.

The widgets that Integrity recommends for the default dashboard include:

### Quick links widget

The Quick Links widget allows the site administrator to define a set of 4-5 actions that will each be highlighted with a large icon and label on the “home” page. They are designed to help a novice user quickly navigate the site to complete common tasks. As such it is recommended that these actions be represented by “action-based” phrases that are common to the user, without using jargon or technical terminology.

Actions determined for Quick Links widget on default global user dashboard:

* Enroll a New Subject
* Begin a New Visit
* Review Existing Study Data
* Archive Image Data
* Check on Project Status

Widget Parameters – none available

### System Alert

This widget displays all active system notifications (includes timestamp). The admin has control over the text. Users cannot remove, minimize or move this widget.

If there is no alert to display, it will not appear and Project Alerts will move up.

Widget Parameters – none available

### Project Alerts widget

Aggregates all active “Project Messages/Alerts” across the projects the user has access to.

Each alert item will display:

* Project name
* Username of the person who set up the alert
* Alert message
* Action to dismiss the alert
* Timestamp

#### Widget Parameters

* Collapsible

### Projects You Recently AccesseD

Displays the last 5 projects the user accessed. Shows Project Label and Project ID (less prominent)

* Intention is to preserve feature of “My Projects” widget on XNAT 1.6 by quickly displaying projects by time accessed. Historically, this has been the most common way for users to access project information.

Widget Parameters – none available

### Did You Know?

Basically, this is a tip of the day widget. Slides used in this widget should focus on highlighting features from earlier XNAT versions that have moved, and new or previously underused features that the NRG would like to merchandise.

Features of the widget:

* Slider
* Can show 3 tips that cycled through automatically or manually on click.
* Provide links to both the feature itself within the application and links to the corresponding page in the XNAT Help Center (out of scope)

Widget Parameters – none available

### Data Summary widget (global dashboard)

The goal of this widget is to serve as a point of entry for the user to dive deeper into their project data by displaying high-level information regarding data activity within all the user’s projects. This widget is broken up into two summary sections:

#### Data Overview

Provides aggregate information about data activity on all the user’s projects over the last 24 hours. This section of the widget will display a list of datatypes and the number of datatype objects that have been added to the user’s projects.

#### Project Discrepancies Overview

Displays in a list the number of active discrepancies per-project.

Nothing within this widget is hyperlinked, and the user cannot take any action from within this widget.

Widget Parameters – none available

### Recent Data Activity (global)

See Recent Data Activity under “Common Widgets” for more information.

The Recent Data Activity widget on the Global Dashboard will not be expandable to show the additional audit trail information.

No custom dashboards will be available in the out-of-the-box deployment of XNAT.

# Common Widgets

For widgets that appear only on the Global Dashboard (See Widgets on Default Global Dashboard)

### Recent Activity widget

The Recent Activity widget will display the data modification activity of the current Data Object. The goal is to serve up a more user-friendly form of the audit trail that will also be useful to users in a non-audit role.

**Audit Trail view**

Each row in the Recent Activity widget is actually a high-level account of the data transaction that has occurred. It will not show specifically what was changed about a data object. This information is only available after the user clicks on the row to expand its contents.

A complication that accompanies displaying the details of an entry is that the entire audit trail data for this current data object must be loaded in order to load the details of a single entry. The solution in the UI for now is to prompt the user with a confirmation modal when they click on a row. The modal will warn the user that the operation may take a long time to complete.

**The Recent Activity widget has robust filtering options to assist in navigating the data**

**By Category:** The types of activity identified so far are:

* Pipeline
* Access (if on project or dashboard)
* Data

**By Date Range:** This filter is set to “Last 7 Days” by default. It will also have options to view the activity for the last 14 days, the last 30 days or to enter a custom date range.

The table will be sorted from “Newest to Oldest” by default.

Each row in the widget will display the following information:

* Time
* Event – will have in parentheses the source of the action (usually username, can be pipeline, can be command line script)
* Action – What type of data modification occurred? These values will fall loosely within the categories of:
  + Created
  + Updated
  + Modified
* Reason – NRG has indicated that they would like most data modifications that occur to require a reason.

By default, the Recent Activity widget is in the main content column only on the Global User Dashboard and the Project Detail page. On the other report-type pages, “Recent Activity” will appear as a sidebar widget.

For the smaller widget size, the following columns will be displayed in the table:

* Time
* Event
* Action

**Known instances of Recent Data widget:**

* Default Global User Dashboard – “Recent Data Activity”
* Project Detail page – “Recent Project Activity”
* All report pages below Project – “Recent Activity”

The widget has the following widget parameters:

* Maximized view – (useful especially when viewing the expanded rows)

### “Actions for…” widget

This widget will appear in the sidebar column of all report-type pages by default. It aggregates the Tasks and Discrepancies that are related to the current Data Object and allows users to take action on individual Tasks and Discrepancies directly from the widget.

The widget has a tabbed interface for “Tasks” and “Discrepancies.” The tabs will receive a notification icon indicating the number of entries available for each. The notification icon will show a maximum of “99+”. The bottom portion of each tab section is a See All link that will take the user to the Task Manager and Discrepancy Manager, depending on the active tab.

The title of the widget will be specific to the data object that the user is currently on, e.g. “Actions for Lorem Ipsum Project.”

Each tab in the widget will automatically load a maximum of 10 entries for that page, ordered by Date Modified (most recent at the top).

**Tasks**

The following attributes are displayed for each card:

* Title of the Task (truncated appropriately)
* Status (See Task Statuses for full list)
* Priority
* Time Added
* Latest Comment – excerpt of the latest comment to a Task

The follow actions appear on hover over a card:

* **See Details** – displays the “Task Detail” modal, which allows the user to see the full Task Name, the full description, the Comments and changes made to the ticket so far.
* **Update/Reassign** – displays the “Edit Task” modal, which allows the user to change the status of the task, change who the task is assigned to, change the priority level of the task and leave a comment on the task.

**Discrepancies**

The following attributes are displayed for each card:

* Status (See Discrepancy Statuses for full list)
* Assigned To
* Last Updated
* Data
* Description

The following actions appear on hover over a card:

* **See Details** – opens the “Discrepancy Detail” modal, which allows the user to see the History of the discrepancy and the meta information attached to the discrepancy object.
* **Assign as a task** – opens the “Assign Discrepancy as Task” modal. Same form elements as “Create a New Task” modal (Task Name, Priority Level, Assigned To, Comment).
* **Update Discrepancy** – opens the “Edit Discrepancy” modal, which allows users to change the status of the discrepancy and offer an explanation for the change.

Widget Parameters

* Maximize widget
* Collapse widget

### Details and Additional Details

The Details widget will by default expose only the key identifying information about the Data Object. These pieces of information were identified as:

* Accession Number
* Date Added – will include parenthetical of the user who added the Data Object
* Acquisition Time

For any Data Object that exists deeper within the data hierarchy than Subjects (includes Visits, Experiments, and Assessments), the Details widget will also contain a sectioned off area that reveals key features of the preceding Data Objects in its data hierarchy. For example:

* If the Data Object exists within a Subject, this area will show:
  + Subject ID
  + Gender
  + YOB/DOB/Age
* If the Data Object exists within a Visit, this area will also show:
  + Visit ID
  + Visit Type
  + Visit in Sequence

Additional Details is an accordion menu that will appear underneath the contents of the Details widget and will house the non-critical attributes of the data object (includes custom added variables to datatypes as well).

This widget does not appear on the Project detail page.

### Data Summary

The Data Summary widget is a non-interactive display of all the descendent data objects related to the current data object. Each entry will consist of:

* Numerical count of datatypes
* Friendly label for the datatype

### Data Tables

(reference “Data Tables” section)

#### Widget Parameters

* Maximized View

# **“Report” Pages**

Not to be confused with My Reports and other pages related to reporting. Defined as “a page whose primary role is to display the data associated with a single corresponding Data Object”.

* All report pages have a “Default” view that Integrity is defining and delivering.
* Site admins will be able to add to and modify the templates for Report pages on a per-project basis.

### Command Ribbon (shared feature of Report pages)

The command ribbon will be a defining UI component of Report type pages. It contains actions at the Data Object level.

* Each ribbon has predefined sections, specific to the data level of the Object in question. For example, the MR Session page will have a “Processing” section that contains the action “Execute Pipeline,” which is unique to the Image Session datatypes. Sections are labeled in a row underneath the actions.
* Each of the predefined sections can house additional non-default actions via modules.
* In general, additions to the Command Ribbon should be housed in the “Custom Actions” section, available on all Command Ribbons
* If the number of actions for a section exceeds the number that can be easily displayed on that piece of the command ribbon, they are put in a “More” dropdown that appears to the right of the section label.
  + The “More” link will have a numeric indicator “(#)” to expose how many additional actions can be accessed through a section’s more dropdown.
* There are four different kinds of “buttons” on the Command Ribbon, to aid in establishing a hierarchy for the different actions. Any additions made to the Command Ribbon via a module needs to specify which variation is present:
  + Large icon + text underneath
  + Large icon + text underneath (dropdown)
  + Small icon + text to the right (one line)
  + Small icon + text to the right (two lines)
  + Text Only
* The available actions displayed in the command ribbon are limited by user role (“Member,” “Collaborator,” “Owner”). At lower permission levels, the unavailable actions are removed and those that are available move to the left to fill up the empty space. Integrity is only responsible for defining the Project Owner Command Ribbon.

**Below are some of the actions available for display on Command Ribbons at all the data levels** (unique elements of each command ribbon will be defined in the sections for their respective pages):

#### Edit – under “General”

* This action takes the user to the “Edit” page for that Data Object (see features of the “Edit” form page).

#### Sharing – under “General”, not available on Project

* If the Data Object has already been shared into another project, a numeric indicator appears to the right of “Sharing”, e.g. (3), if the Object has been shared into three different projects.
* Clicking on “Share” opens a modal where the user can share the Data Object with other projects available for sharing
  + The modal shows the user if that Data Object has been shared into any other projects
  + The modal also displays all the projects where that Data Object has been shared, containing the following information:
    - Name of Project
    - Note
    - Name that the Project was shared as
  + The user can “Unshare” the Data Object, which would delete it from the other project.

#### Remove Data – under “General”, not available on Project

* This action opens the “Remove Data” modal.
* This action is NOT reversible
* Once the user starts removing data by clicking on “Remove Data,” the Removal Progress field updates with the following states:
  + Percentage Complete
  + Completed
  + Error – if a problem is encountered in the removal process
* While the Removal is being processed, the action button will become non-clickable and read “Removing…”
* The user has no way to reconcile the error from the interface, but the error message will provide as much information as possible about the obstacle.
* If an error is encountered, the button will update to read “Close.”

#### Files (Out of Scope)

1. Download
   1. Images
   2. Files
   3. XML
2. Upload
3. Manage Files

#### Create a New Task

* The “Create a New Task” button opens up a modal that allows users with appropriate permissions to assign a task to a user associated with the current Data Object.
* See “Issues Framework –Tasks” for more information.
* The fields that this form will display:
  + Task Name
  + Priority
  + Assign To
  + Description

#### “Custom Actions”

* Catchall for third-party actions for a Data Object.
* This section will expose as many custom action links as can fit within the element.

## Project Detail

### Command Ribbon (Project) - Unique Actions on this Command Ribbon:

#### Add…

1. Subject
2. Experiment
3. Visit
4. Customizable actions to highlight (e.g. “+MR Session”)

### Project Owner Command Ribbon

The Command Ribbon for Project Owners will appear above the normal Command Ribbon for the Project page. It will only be visible to users with “Project Owner” level permissions and contain:

1. Edit Project Configuration
   1. Links to “Project Configuration” page
2. Edit Project Users (link to “Users/Access” tab within “Project Configuration”)
3. Create Project Message
   1. Opens a modal containing a simple text area to hold the project message.
   2. Character limit of 1,500 characters.
   3. Only one project message can be displayed at any one time.
   4. The message will be displayed as a widget in the main content column directly underneath the Project Command Ribbon (pushes down all the other content in that area). Will show the following information:
      1. Author of the message
      2. Timestamp
      3. Message Body

### Main Content Widgets

* Details + Additional Details
* Data Overview
* Recent Project Activity
* Project Data

#### Project Data

Unique Features of this Data Table

* LH navigation, allowing user to load multiple tables that will appear as tabs in this navigation area.
* Load Project Data – a dropdown containing all the datatypes that have been used in the project (including “Outside Data,” if data has been uploaded that was not previously defined in the Data Configuration).
* Load Saved Table - a dropdown that contains a list of all Saved Data Tables that exclusively contains data belonging to this project.
* These tabs can also be pinned by the user (the “pin” icon will appear on hover by the user over the tab) so that they will be available when the user returns to the page, to avoid having to load the tab again through one of the dropdown options.
* “Status” column, if Visits have been configured, to display a data summary by Visit.

The Project Data widget will, by default, load the “Subjects” tables. If Visits have been set up for this project, the “Subjects by Visit” will be loaded by Visit.

The Project Data widget contains a couple unique tables which are geared toward lab managers who want to view the status of their project. These “Status” table views have the following unique features:

* “Status” columns that display aggregated data about active tasks and discrepancies on the data object.

### Sidebar Widgets

* Files (Out of Scope)
* “Actions for…”

## Subject Detail

### Command Ribbon (Subject)

Actions unique to the Subject detail page:

**Add…**

* Experiment
  + […] All Experiment-level datatypes set up for this project
* Visit
* Customizable - Selected datatypes to highlight

### Main Content Widgets

* Details + Additional Details
* Data Summary
* Subject Data (described below)

#### Subject Data

The Subject Data widget is a Data Table that has two different views, which the user toggles using icons located above the table. The two views are “Experiments grouped by Visits” and “Experiments only.” The viewing options are only available if Visits have been set up for the Project.

If the Subject has been shared into other projects, a list of those projects will be displayed as links above the table. When clicked, these links will trigger a tooltip containing the Data Summary information for the project in question.

**Experiments grouped by “Visits”**

This widget will display a group of tables, which are separated by each Visit Data Object related to the Subject. Each of these tables will have a header containing information specific to the Visit:

* Visit ID
* Date Range – derived from Experiments that the visit contained, displayed in timestamp format
* Status
  + Incomplete (#/#) – based on requirements defined in visit template assigned to the Visit
  + Complete
  + Not yet started – if no data has been uploaded to this project

Each table will have the following columns:

* Date
* Experiment Type
* Project ID
* Label
* Status
  + Incomplete (#/#)
  + Complete
  + Not yet started
* Actions
  + Shows the number of active discrepancies and active tasks for the data object
  + Within the “Unassigned and Miscellaneous” table, there will also be an “Assign to a Visit” link
    - When clicked, this opens the “Assign to a Visit” modal, which contains a dropdown list of the Visits that have been created for this Subject so far.

The “Experiments Grouped by Visits” table is the only one that will have the section “Unassigned and Miscellaneous” to catch any Experiments that are uploaded which were not assigned a particular Visit.

If a Visit Sequence has been set up, the Visits that have not yet been created will have “cards” located below the created Visits, with a link prompting the user to “Create this Visit.” The link will take the user to the “Create Visit” workflow.

**Experiments Only**

Data Table Parameters:

* Columns are sortable, but not filterable
* No pagination/basic table utilities

This table will contain the following columns:

* Date Created
* Experiment Type
* Visit – will be left blank if the Experiment has not been assigned to a Visit
* Label
* Actions
  + Shows the number of active discrepancies and active tasks for the data object
  + If an Experiment is not assigned to a visit , there will also be a “Assign to a Visit” link
    - When clicked, this opens the “Assign to a Visit” modal, which contains a dropdown list of the Visits that have been created for this Subject so far.

### Sidebar Widgets

* Files (Out of Scope)
* “Actions for…”

## Visit Detail

### Command Ribbon (Visit)

No actions unique to the Visit page by default.

### Main Content Widgets

* Details + Additional Details
* Data Summary
* Visit Data –same functionality as “Experiments Only” table under Subject Data. On hover, each row will also display an “Unassign Experiment” link in the Actions column.

### Sidebar Widgets

* Files (Out of Scope)
* Recent Activity
* “Actions for…”

## Experiment Detail

### Command Ribbon (Experiment)

No unique actions by default (Look at Image Session, for pipeline processing, scan-related actions)

### Main Content Widgets

* Details + Additional Details
* Data Overview
* Experiment Data (Assessments)

### Sidebar Widgets

* Files
* Recent Data Activity
* “Actions for…”

## Image Session Detail

### Command Ribbon (Image Session)

Actions unique to an Image Session detail page:

**Processing**

* Execute Pipelines (explained below)

**General**

* Launch Image Viewer (Out of Scope)

#### Execute Pipelines

The Execute Pipelines action in the Command Ribbon opens the Execute Pipelines modal. This modal is populated by a card-view list of the pipelines that have been configured for this project. Each card will contain the following information:

* Friendly name of the pipeline
* Name of file related to the pipeline
* Affects - “N/A” should be supplied as the value if irrelevant to item
* Generates – “N/A” should be supplied as the value if irrelevant to item
* Description

A “Run this Pipeline” button appears on hover over a card.

**Run this Pipeline**

If the Pipeline select requires user review or user input before the pipeline can be run on the current Data Object, the modal updates into the “Run [Pipeline Name] Pipeline” screen, where the parameters in question are displayed for the user to review.

A “Go Back” button will allow the user to return to the list of pipelines. The action button is labeled “Run Processing.” Run Processing will close the “Run this Pipeline” modal and create a notification indicating that an email will be sent to the specified email addresses when the pipeline is complete.

### Main Content Widgets

* Details + Additional Details
* Data Overview
* Scans - Filmstrip Viewer
* Session Data (Assessments)

#### Scans

The Scans widget has two different views: “As Table” and “Slideshow.” The “Slideshow” view also enables the user to open the Filmstrip Viewer modal for viewing and comparing images.

**“As Table” view**

By default, the table rows will be displayed in the order of “Scan No.”

Data Table parameters

* Column Headers are sortable. No dropdown menu for the column header.

The following columns are displayed:

* Scan No.
* Type – abbr. for “Scan Type”
* No. of Frames
* Quality
* Files – this information WILL be displayed on load (a new feature in XNAT 2.0)
* Note

**“Slideshow” view**

By default, the slides will be displayed in order of “Scan No.” No sorting options available.

Each slide will show the following information:

* Thumbnail – will have dimension of at least 100x100 and will accommodate scans that will have a “tiled” thumbnail
* Scan ID
* Scan Type
* Quality – will only show “usable,” “questionable,” and “unusable”
* Files – will only show “[File Tye] (# of files, file size)”
* Note – show excerpt that fits comfortably in the slide’s vertical space

The slideshow view will have a horizontal scrollbar.

Clicking on the Scan Thumbnail or Scan ID will open the Filmstrip Viewer modal.

**Filmstrip Viewer Modal**

This modal offers an image previewer for the User who does not want to open the expensive Java Image viewer applet. This modal allows for the following operations:

* Cycling through frames within a scan
* Cycling through scans within the MR Session
* Keyboard shortcuts (only for the single scan view, not available for comparison view)
  + Left and right arrows navigate through frames within a scan
  + Up and down arrows navigate between scans within a session
* The full details of the scan (only visible on single scan view)
  + The full details will depend on the type of scan collected, but sample attributes include:
    - Series Desc
    - Vox. Res
    - FOV
    - TR
  + The full details will also contain the entire note associated with a scan.
* The ability to load two scans side-by-side via the Comparison View
* The modal does NOT allow users to run any sort of image processing or filters on the scans.

**Comparison View**

User activates this mode by clicking on “Compare to Another Scan” button. The layout of the modal will change to be a 50/50 split between the two loaded scans.

The right panel will be where the new scan is loaded. Before the second scan is displayed, the user must fill out the form asking for which scan to load. The form will consist of:

* Project – AutoComplete single select dropdown
* Scan – AutoComplete single select dropdown
* Image Session – AutoComplete single select dropdown
* Scans – AutoComplete single select dropdown

The Project, Scan, and Image Session fields will be prepopulated with the current Session’s information.

**Widget Parameters**

* Maximized view

### Sidebar widgets

* Files
* Recent Data Activity
* “Actions for…”

# Project Configuration

The set of pages chosen to make up “Project Configuration” were chosen with the goal of centralizing the management of a project from a project administrator’s point-of-view. This includes user tasks like setting up rules to govern the data accepted into the project, inviting and removing users from the project, and defining the resources available to the project and its members. The goal for this section is to become a hub for any project-level changes that need to occur.

The Project Configuration hub consists of the following tabs:

* General Settings
* Users
* Data Configuration
* Pipelines
* Utilities

The “Project Configuration” page is only accessible to users with Project-Owner level permissions. These users are able to navigate to this page by choosing “Edit Project Configuration” from the Project Administration Command Ribbon. Also, the first time that the user creates a project, if they choose to set up their “Data Configuration” during the creation process, then they will be taken to the Project Configuration landing page upon completing the process.

#### Quick Links

Similar to the “Quick Links” widget located on the Global User Dashboard, the Project Owner admin dashboard has a set of five Quick Links to make accessing common user tasks easier and more straightforward for the average user.

**Unique Scenario:** Immediately after a user creates a project for the first time (and they have chosen to go through the Data Configuration portion of the setup process), they will be taken to the Project Configuration page. The Quick Links will be visible by default in this scenario only, and will also have a special introduction text to the features available within Project Configuration, as well as a notification that the “Project was successfully Created”

The widget is otherwise hidden by default and can be toggled on by the user via a “Show Quicklinks” button located on all first-level pages within Project Configuration.

By default, this widget contains the following actions:

* **Invite users** – Navigates to “Users” tab
* **Set up Visit Sequence** – Navigates to “Set Up Visit Sequence” page, a feature under Data Configuration
* **Add custom variables to datatypes** – Navigates to “Customize Datatypes” page, a feature under Data Configuration
* **Set up pipelines** – Navigates to “Pipelines” tab
* **Configure project utilities** – Navigates to “Utilities” tab

### General Settings

**Project Details**

Display of Project Details collected in “Basic Project Information” step of “Create New Project”.

An “Edit” icon will be present to the right of the header “Project Details.” Clicking on the “Edit” icon, loads the web form associated with the Project Details directly inside the “General Settings” tab, replacing all the other content inside (needs to be loaded and saved without full page reload.)

**Privacy Settings**

Shows whether the project has been set to “Private”, “Public” or “Protected”, along with an explanation of the current setting.

Like the Project Details section of this tab, an “Edit” icon will be present to the right of the header “Privacy Settings.” Clicking on the “Edit” icon, loads the web form associated with the Privacy Settings directly inside the “General Settings” tab, replacing all the other content inside (will be loaded and saved without full page reload).

### Users

See “Users”

### Data Configuration

See “Data Configuration”

### Pipelines

This tab allows the Project Owner to configure the Pipelines that they want available to his/her project.

The table on the Pipelines tab aggregates the active pipelines for the project. Each row has an “Edit” and “Remove” icon that brings up modals to accommodate the respective actions.

The “Add Pipeline” process uses a multi-step wizard within a modal design pattern

#### Add Pipeline

The “Add Pipeline” workflow begins by displaying to the user the pipelines that have been made available by the site admin for this instance of XNAT. This list is rendered in a card view format rather than a table, and displays the following attributes for each entry:

* Friendly Pipeline name – CANNOT be the filename (XNAT 1.6- uses filenames like “WebBasedQCImage.xml” to identify pipelines)
* Filename
* Affects – use “N/A,” if necessary. Also, as part of discovery, it was determined that no pipeline should ever use “All Datatypes.” Each pipeline needs to specify what datatypes they can reasonably affect.
* Generates – use “N/A,” if necessary
* Description

An “Add this Pipeline” button will appear on hover over a card in this list.

**Setup Wizard**

The Setup Wizard that has been defined serves as a template for future pipeline developers. A stepped setup process has been introduced for pipelines in an effort to mitigate what has been an opaque setup process in previous versions of XNAT.

The Setup Wizard for a pipeline requires the following information for each input requested of the user:

* A user-friendly label, in addition to the developer-friendly form label
* Help/Explanation text, exposed by default, according to form UI guidelines.
* Validation, where appropriate
* Use of correct UI components (for example, in the fBIRN Pre-Processing pipeline, using an AutoComplete Multiselect dropdown UI for fields that require the user to provide “Scan Type” information)
* Separate the form into multiple steps where there are logical breaking points, if any, within the form.

The “Review” step in a Pipeline setup process is not required, and only recommended for forms with many steps. The Review step displays a preview of the information that the user has provided so far. “Stepping backward” functionality with the “Back” link is removed on this step, and users will use “Edit” icons located next to each fieldset of the preview to jump directly to an “Edit Step [#]” page.

Once the user clicks “Finished. Set up [Name] Pipeline,” they are taken to the “Pipelines” tab on the Project Configuration page.

**Developer View**

A “Developer View” of the pipeline setup process is also preserved, in order to cater to the Advanced XNAT users who are comfortable with unfriendly parameter labels and may have existing lab workflows that allow them to quickly enter the parameters of a pipeline (and would be frustrated by the stepped process offered by the Setup Wizard). The developer view is accessed by clicking on the “Switch to Developer View” text link next to the title of the Pipeline being configured.

### Utilities (out of scope)

A catchall section for all third-party modules that have project-level actions and require configuration at the project level. Known examples include:

* File Mapping utility
* Anonymization Script utility

These modules will use the general Widget UI guidelines in order to render their interface on this tab.

# Data Configuration

This area of the application (found within “Project Configuration”) allows a project to take advantage of powerful tools to assess missing data, to further organize the XNAT data structure with the addition of the Visit datatype, to monitor the status of different parts of the project, to customize existing datatypes, and to set up rules that can provide a basic level of automated quality control over project data.

The tools available in the section include:

* Edit Project Structure
* Manage Visit Templates
* Set Up/Manage Visit Sequence
* Manage Subject Dossier
* Data Type Manager (on projects without a Visit Structure)
* Customize Datatypes
* Rules governing discrepancies (XML import – will not be available on XNAT 2.0)

Because we are trying to encourage adoption of the features that Data Configuration offers (in particular, the use of Visits), Data Configuration has been incorporated as an optional step in the “Create New Project” workflow.

At its most fundamental level, a Visit is a Data Object that users can use to group Experiments that are related by the time they were administered or by the time the data was collected. In real life lab workflow terms, a human subject enrolled in the lab may be called in for a checkup where a basic physical exam, MRI scan, and blood tests are administered. Those experiments would take advantage of a Visit data object as a grouping element. Since experiments are often defined in sets, usually as part of the lab’s protocol, this makes the Visit datatype the ideal level for the system to evaluate the collected data to see if it is sufficient or if it falls within predefined standards. The Visit data object also allows for the edge cases where patients leave in the middle of a session because of outside forces and does not complete the rest of the session until two weeks later. Since the elements of the Visit are manually added, this makes it possible to relate the two parts of the session to each other during analysis.

The Visit data object is fundamental to the advanced data configuration, as it becomes the level in the data structure where rules can comfortably and logically be established to evaluate if data is erroneous or missing.

The data configuration is stored neatly as an XML document which can be downloaded from the “History” table on the Data Configuration tab. The way the Visits are configured in the UI to serve as a monitoring tool of all collected data is explained in the following section “Create New Project.”

## Create New Project

“Create New Project” is only accessible via the Site Navigation, under the “Create…” dropdown menu, and also as an action on the expanded “My Projects” dropdown.

Note: The “Create New…” is being considered under the “Data Configuration” section because it links pages that will appear within “Data Configuration” in a step-by-step wizard format.

### 01. Basic Project Information

The first step in creating a new project is a basic webform. See “**User Interface Guidelines for Forms**” document.

The user will be given the option to create the project with or without going through the Data Configuration process.

The following fields are required:

* Title
* Abbreviation
* Description
* Project Investigator
* Privacy Settings

Note: Both the options “Create Project and Configure Data” or “Create Project and Skip Data Configuration” will cause the Project to be created in the [XNAT] database.

### 02. Data Configuration: Does this project use a “Visit” structure?

This page contains more help and tutorial information than most application pages to better introduce the user to the uses of this feature.

### 03(a). Data Configuration – “Yes, help me set up Visits for this project”

#### Step 1: Create Visit Templates

Background: If we revisit the real life description of how Visits fall within a lab’s workflow, we can add a layer of complexity to the scenario. For many labs, the experiments that are administered to the subject are actually based on the subject’s situation (for example, if he/she has been sick in the last 30 days, etc). The visits templates are a way for the project owner to define multiple sets of required experiments to correspond to the different sets of experiments that would be administered to a healthy subject vs. a sick one.

Visit Templates are the first step that allows the project to make use of the Visit data object as a tool to manage project data.

The goal of a Visit Template is to allow the project owner to define a set of data objects that are required in order for a Visit to be considered complete.

**Visit Templates table**

The table “Visit Templates” shows the templates that have been set up

Users will be able to import templates set up for other projects they have access to (Collaborator+) by clicking on the “Import from existing project” button.

The button “Create a New Template,” opens the “Create a New Visit Template” page (specifications)

The following actions are available for each row in the “Visit Templates” table:

* Edit – Opens “Edit Visit Template” page
* Duplicate – Creates a new entry (AJAX interaction) to the table directly underneath the duplicated row. The Visit Template name will be the same as the origin template with “copy” appended to the end.
* Remove – Opens “Remove – Confirmation Modal.”

**How do Visit Templates influence other parts of the application UI?**

Whenever the user needs to create a visit or update the visit type for an existing visit, they will have to choose from the Visit Type dropdown, which is populated by the Visit Templates set up for a project.

Visit Templates also need to be set up before the user can define a visit sequence.

**Create a New Visit Template page**

This page uses a “Curate List” design pattern.

Parameters:

* “Pool” section
  + Accordion Lists
  + Two tabs to browse contents of “Pool”: “All Datatypes” and “Packages”
  + The Packages tab will group elements on namespace and attributes that will be defined by the NRG and provided to Integrity
  + On the Packages tab, duplication of a datatype is allowed between different packages.
    - Requires that a style is defined for duplicates when another instance of the same datatype has been added to the selection, but for a different package.
* “Select” section
  + Allows for a Range to be defined.
    - “Min” of 0 or left blank means that the datatype is optional
    - “Max” of 0 or left blank means that there is no upper limit to the instances of that datatype within that Visit Template before triggering a warning.
  + Accordion Lists groups (need to finalize with NRG on Monday, June 11)

#### Step 2: Populate Subject Dossier

The Subject Dossier (working name) is a catch-all for subject-level data that is required, but falls outside the logical bounds of a Visit. The reasons that Experiments can fall outside of the logical bounds of a Visit, is that Visits are assumed to be capturing time-specific data, because they are intended for longitudinal studies that track changes over time. Some subject-level data is only need to be collected once, and that type of data would be tracked inside the Subject Dossier, e.g. demographic information and medical history experiment datatypes.

The interface recycles the same interface as the “Create a New Visit Template” interface (reference above) with the addition of explanation text that firmly describes the dossier’s place in the data structure.

#### Finish Data Configuration

When the “Finish” button is chosen on the “Subject Dossier” step, the system processes the configuration and creates the project. The User is taken to the “Project Configuration” page of the newly created project and sees the one-time “Quick Links” panel expanded, which highlights features available to users who want to construct a more advanced data configuration structure (See “Project Configuration” introduction for more information on “Quick Links” widget)

### Data Configuration – “No, this project does not use Visits”

The “No” selection takes the user through the simpler data configuration step of only selecting the datatypes that will be available to members of the project.

This selection simplifies pages where project members will need to choose from a list of datatypes by constraining the displayed list to those that have been identified as project datatypes.

#### Manage Datatypes

The interface recycles the “Curate List” design pattern from the “Create a New Visit Template” page from the “Yes” workflow (See above for list of features and parameters).

## Visit Sequence

This feature is NOT accessible via the “Create New Project” workflow as it was identified as offering more functionality than most users will want to be concerned with.

If Visit Templates allow the project owner to define what must be captured within a Visit, the Visit Sequence allows project owners to define the number and types of Visits every Subject in the project needs to have before being considered complete.

The Visit Sequence is set up from the Data Configuration page, providing that the project has enabled Visits. The UI has the following features:

* Each entry that will require input from the user on the following:
  + Visit Name – (e.g. Baseline Visit, 2 year, 3 year, Follow-up)
  + The visit templates that should be options for this visit (AutoComplete Multi-Select UI)
  + A checkbox that reads “Allow more than one instance of this visit?”, which when checked means that this visit is not constrained to only occur once (e.g., a Baseline Visit will likely only occur once, but a “Follow-Up” may occur numerous times).
* The user can click on the drag and drop “handle” to rearrange the order of the Visits, indicating that one Visit needs to occur before another one (e.g. Baseline Visit has to come before “Follow-Up”)

### other ways that visit impacts the ui

#### On the Subject Detail page:

* **Visits and Experiments table:** You CAN edit the Visit Type directly, as well as the date.
* **Visits and Experiments table:** For visits that have not yet been made, the option to “Create a Visit” is available next to the label.
* **Visit and Experiments table**: Associate experiments filed under “Unassigned” with Visits.

#### On the Session/Experiment Detail page:

* Link to disassociate a Session/Experiment with its Visit
* Link to associate an orphaned Session/Experiment with a Visit
* Part of this includes being able to “Create a New Visit” directly from this link

#### Sharing between Projects:

* Visits cannot be shared
* Discrepancies and protocol rules are not shared even in the case of Umbrella Project

# Users

The User tab within “Project Configuration” is where Project Owners can add, invite or remove users from their project or modify a user’s project access permissions.

This page allows users to be added through two mechanisms:

1. By Email (“Invite by Email” button)
2. By Username (“Add Existing Users” button)

### Terminology: Invite vs Add

The **Invite** action only refers to potential users who do not already have a user account on XNAT. On the other hand, **Add** only refers to users who are already a part of the system. This distinction is important because “Added” users will not need to confirm their addition to a project. Their enrollment into a project is automatic, and occurs once the project owner “adds” them from the Users page. “Invited” users will need to confirm their enrollment by clicking on a link in an email. The linked page will give these users the opportunity to use an existing XNAT account, if the invitation was sent to a different email address, for instance. The workflows of these distinct paths are discussed in the following sections.

Regardless of whether a user has been “Invited” or “Added,” the system will send out a notification email to prompt the user about their new access to a project.

### Current Project Users Table

Displays the list of all current users, and their roles, including the following columns:

* Username
* First Name
* Last Name
* Email Address
* Role/Status
  + If an invitation has been sent out but not yet accepted, this column will display that date when the invite was sent.
* Actions
  + Project Owners can “Remove” a user from their project (prompting a confirmation modal).
  + Project Owners can “Resend Invite” to new users who have not yet created an account. This resends the invitation email and updates the date when the invite was sent.

Above the table there is also a filter to easily see users by role/status level:

* All Users (default)
* Collaborators
* Members
* Owners
* Pending Invitations

## Invite by Email

Clicking on “Invite by Email” opens a modal where a comma-delimited list of email addresses can be pasted into a text area and a project role can be selected from a dropdown menu (“Owner,” “Collaborator,” “Member”). The modal operates under the constraint that the project owner can only invite users of a single project role at a time.

A custom message can be appended to all invitations sent out at one time.

**Summary of Components**

* Email Address – TEXTAREA to allow multiple email addresses to be pasted in
* Role in Project – DROPDOWN
* Add Button – to “Add” users to the list
* Area showing the default message text (not editable)
* Add a Message (optional) – TEXTAREA
* “Preview Email Invite” button
* “Send” button

Once the “Add” button is clicked, the users and their respective roles appear underneath, in alphabetical order. Here, an email address can be deleted from the “send” list.

If an email address is added with the wrong access level, that email address must be deleted and re-added with the correct role indicated.

The “Preview Email Invite” button prompts a new POP-UP window displaying the preview (cannot take action from the preview window). From there, the user can close out of the preview and click “Invite These Users” button.

The system will intelligently process the list of email addresses in order to send out the appropriate email, depending on if the user has been “Invited” or “Added.” An “Invitation” email containing a link to a registration page unique to that Project and email address will be sent to those email addresses the system cannot match with a username in the system database. A more generic “You have been added to [Project Name] Project” email message will be sent to users who are “Added” (i.e. the system identifies an existing user account associated with the email address).

## Add Existing XNAT Users

Clicking on “Add Existing XNAT Users” opens a modal that allows the Project Owner to add existing XNAT users to this project. It is intended to address the use cases of building a list of users to add from scratch or importing the users from another XNAT project.

This modal will use a modified “Curated List” design pattern. Instead of “Add” and “Remove” actions to move elements from the Pool to Selected side, the movement is accomplished when the Project Owner selects a project role for the user they want to add.

### Pool

**Components**

* AutoComplete to Filter the list of users within the Pool
* On mouse over of user, a series of small buttons fade in that correspond to the different project roles – “Member,” “Collaborator,” “Owner.” Clicking one of these roles moves the user to the Selected side.
* If the user is already a member of the project, the username can still appear as an item in the pool, but with the indication “*Already a [Project Role] in this Project.*” The Owner CANNOT edit the project role of a user or remove the user from the project via this interface if the user is already a member of this project. Those actions can only be performed from the “Current Project Users” table on the Users page.

#### Filter by Project box and related “Add all Users”

This UI piece addresses the need to filter the list of existing users by Project and directly import the permissions for that resulting list of users to the new project.

To retain its usefulness as a filtering tool and not just as an “Import” tool, the “Add All Users” action was added to separate the movement of users to the Selected section.

### Selected – named “users to add to this project”

The selected items are grouped by Project Roles in Accordion List components (Owners, Collaborators, Members)

The list items have the same format they have on the Pool side.

On mouse over of an item in the list, a series of small buttons corresponding to the different project roles fade in. The button corresponding to the role that this user has been assigned to (a requirement of being added to the Select side) has an “active” state. The user can be reassigned to a different project role by choosing one of the option role options.

“Remove” also appears on mouse over of an element in the Selected column. When clicked, it moves the user back into the Pool.

“Add Users to Project” submits the list of users in the Selected column to be added to the Project.

The Owner can also “Add a Message (optional),” which will appear in the notification email sent to “added” users.

# Issues Framework

## Discrepancies

* Discrepancies are system checks against structural, organizational, and data-level rules the project owner establishes in the Data Configuration portion of the “Create New Project” or “Project Configuration” portions of [XNAT].
* Discrepancies will be represented as close as possible to the data point generating the error, and will be represented with an icon.
* These icons can be clicked on, to allow users with appropriate permissions to quickly edit the discrepancies.
* Editable features are:
  + Status
  + Assigned To
  + If a value is provided to Assigned To, a selection for “Priority Level” is also required (because it is a requirement of the related Issue object, the Task)
* Discrepancies are manifested through the following display mechanisms.
  + “Actions for…” widget on all report level pages.
  + Inline discrepancy icons
    - Can be next to a field value or within an “Actions” column of a table, or inside the “Accordion” element.
* Statuses for discrepancies:
  + Active Statuses
    - **Open** – generated by the system
    - **In Progress** – indicates that someone wants to handle the discrepancy. Not necessary to assign.
    - **Reopened** – rules check indicates that a “resolved” ticket does not satisfy the validation requirements.
  + Resolved Statuses
    - **Closed, but without Resolution** – indicates that a team member with appropriate permissions has decided that the system check can be overridden without addressing the data problem.
    - **Superseded** – only occurs if a later definition of Data Configuration for a project invalidates a discrepancy generated by a previous definition.
* **Discrepancies are user-agnostic**, meaning that at the time they are generated, they will not be assigned to any user.
* **Also, at least initially, discrepancies will be visible to users of all permission levels (so they are considered a part of the Project Data itself).**
* Alternatively, discrepancies can be assigned to a predetermined user, like the data manager (as a Task, which means it will be populated in their “Task List” – in the Site Navigation).
* Discrepancies, should they require being elevated to an assigned task, can be manually assigned to a project member as a Task (permissible to Project Collaborators and Owners).
* A cardinal rule for the “Project Requirements” should be that **you are never preventing the user from doing something he/she wants to do**. You can flag it for them to take care of later, but there is no barrier to capturing information. Sample scenario: if someone is adding a 14th scan to the MR Session, when the Rules only call for 13, they should not be prevented from uploading.

Sample Life Cycle of a Discrepancy:

* + Discrepancy is generated when an inconsistency is discovered between the Data Configuration rules and the project data.
  + Discrepancy becomes visible in one of the UI display mechanisms:
    - “Actions for…” widget
    - “[Data Object] Data” table
    - Inline indicator
  + User with appropriate permissions decides to address the discrepancy.
  + He/She changes the status of the discrepancy to “In Progress” and performs the actions necessary to resolve the issue.
  + The resolution triggers the system to run the updated data against the Data Configuration setup for the project.
  + If the issue is resolved, the system flags the discrepancy as resolved, and removes all display of it from the UI.
  + If the resolution does not resolve the issue, the system will not change the status of the discrepancy.
    - In this instance, the user may decide that the violation is not important and mark the discrepancy as “Closed, but without Resolution.”

## Discrepancy Manager

The Discrepancy Manager is intended as a high-level survey of the different discrepancies that need to be accounted for, rather than as a true work list, and therefore does NOT allow granular level filtering. The manager allows Bulk Editing of the discrepancies to change Status and Assignment and an interface for users to quickly find the ticket detail they are looking for.

**Breadcrumbs**

Yes, AutoComplete.

**Data Table parameters:**

* Pagination
* Rows per page
* Column Header menu: only contains “Sort Up” and “Sort Down”
* Inline cell editing (however, icons should appear on hover of the row, not the cell)
* Actions on hover: “See Details” link, “Go to Data Object” icon

**Default parameters**

* “Filter by… Date Last Modified” value: Last week
* Ordered by “Date Last Modified” column, “Newest to Oldest”

**Available filters:**

* Filter by… Status (See Discrepancy Statuses, above)
* Filter by… Assigned To
* Filter by… Date Modified. This dropdown contains the following presets: (NOTE: Same presets as “Recent Data Activity” widgets)
  + Last 24 hours
  + Last Week (default)
  + Last two weeks
  + Custom Date Range

There is NO filtering by columns, for example, “Visit,” “Experiment,” “Assessment”

**Bulk Edit modal**

* Based on selection from the discrepancy manager table (checkboxes).
* The modal contains fields for:
  + Status
  + Assigned To (qualified with “Creates a Task”)
  + When “Assigned To…” is changed from “Unassigned,” Priority Level becomes available.
    - “Low,” “Medium,” and “High” are represented as a tag-radio-button group.

**Inline editing of the “Status” and “Assigned To” values of a discrepancy.**

* Both inline editing features when toggled display Dropdown boxes. Clicking off of the inline editing commits the change
* Progress indicator will appear next to the updated value.

Clicking on a row will take the user to the Discrepancy Detail page.

## Discrepancy Detail page

**Attributes of the Discrepancy Object, displayed in the detail section.**

* ID
* Affects (the Data Object that the discrepancy is registered to, the link is also clickable)
* Date Created
* Date Last Updated
* Description

**Update Box:**

* Status
* “Change to…” status dropdown
* Reason (required)
* Task Assignment

When the discrepancy is unassigned, the Task Assignment contains a link (Assign)

See Related Task links are available for the attributes “Issue ID” and “Task Assignment,” provided that the Discrepancy has been assigned as a task to another team member.

**History Section:**

When an update to the Discrepancy is submitted, it is submitted without a page reload. A new card item will appear at the top of the History section with a graphical indicator that it has been updated by the user (perhaps background is highlighted in a different color and fades out).

Each entry in the History section contains:

* Timestamp
* Status – include what the status was changed from (i.e. Status: Open (changed from New))
* Assigned To – will include “from” as well (i.e. Assigned To: alansheu from [Unassigned])
* Note – a required field for any update to a discrepancy

## Tasks

The purpose of Tasks runs parallel to Discrepancies, as they are another way for users to address inconsistencies in data, but Tasks are managed user to user, rather than auto-generated by the system. Tasks can be created in one of two ways:

* They can be manually created for any data object from the Detail page of that Data Object (e.g. an instance of an “MR Session Detail” page, an instance of “Rad Read Detail” page, etc), by clicking on the “Create a New Task” button in the Command Ribbon
* They can be created by assigning a discrepancy to a team member as a task

**Sample life cycle of a task (generated from a discrepancy)**

* A user notices a discrepancy that needs to be taken care of. He/She assigns it to another team member.
* The team member takes action based on the assigned task and reassigns the task to the original user.
* If the modifications made to the data addresses the issue highlighted by the discrepancy, the discrepancy will be “Resolved” by the system. The original user, after evaluating the task, is able to “Resolve” the task as well.
* If the modifications made to the data do not address the issue highlighted by the discrepancy, the discrepancy remains “Open.” The original user can reassign the task back to the other member with a note clarifying the intent of the task.

**Task Statuses:**

* Active Statuses
  + New
  + Open
* Resolved Statuses
  + Resolved
  + Hold
  + Deleted

## Task Manager

Similar to the Discrepancy Manager

**Breadcrumbs Parameters**

* Yes, AutoComplete.

**Data Table parameters:**

* Pagination
* Rows per page
* Column Header menu: only contains “Sort Up” and “Sort Down”
* Inline cell editing (however, icons should appear on hover of the row, not the cell)
* Actions on hover: “See Details” link, “Go to Data Object” icon

**Default parameters**

* “Filter by… Date Last Modified” value: Last week
* Ordered by “Date Last Modified” column, “Newest to Oldest”

**Available filters:**

* Filter by… Status (See Task Statuses, above)
* Filter by… Assigned To
* Filter by… Date Modified. This dropdown contains the following presets: (NOTE: Same presets as “Recent Data Activity” widgets)
  + Last 24 hours
  + Last Week (default)
  + Last two weeks
  + Custom Date Range

## Task Detail page

**Attributes of the Task Object, displayed in the detail section.**

* ID
* Generated by Discrepancy? (possible values “Yes”, “No”)
* Current Status
* Affects (the Data Object that the discrepancy is registered to, the link is also clickable)
* Date Created
* Date Last Updated
* Description

**Update Box:**

* Change Status
* “Change to…” status dropdown
* Priority Level
* Note

Clicking on “Update Status” will trigger an AJAX update of the page. The update to the content of the “Comments and Changes to this Task” will be highlighted for a short period before fading out. (Reference: WordPress dashboard – Custom Fields update behavior).

“See Related Discrepancy” text links will be available on the attribute “Issue ID” if the Task was generated from a discrepancy.

**“Comments and Changes” Section:**

Each entry into the Comments and Changes section will include:

* The user that effected the update
* Timestamp
* Status – includes “changed from what” information
* Assigned To – includes “assigned from whom” information
* Note – NOT a required form field for Tasks

These entries will be sorted with the oldest at the top. The philosophy here is that users looking at the task should read through the entire conversation before submitting an update. The “Update Task” box is located at the bottom of the Comments and Changes list. When an update is submitted:

* New entry is appended above the “Update Task” box, and immediately below the most recent entry in that section.
* The submission is done via AJAX, without page reload, and the most recent update is highlighted with a graphical indication.

# Prearchive

### In the Site Navigation

* The “Prearchive” icon will have an associated notifications icon indicating how many items are in the Prearchive that the **current user has access to see**.
* The “Prearchive” navigation dropdown will show entries in a non-tabular format (we will refer to them as list-items) that show items in the Prearchive with the following statuses: “**Ready,**” “**Receiving,**” and “**Error**” (List of available statuses).
* Each card will show the following information:
  + **Time Added** (format: YYYY-MM-DDTHH:MM:SS)
  + **Scan Time** (format: YYYY-MM-DDTHH:MM:SS)
  + **Session ID** (format: non-clickable breadcrumb with icons)
  + **Status** (with appropriate color coding and status specific styling)
* “Go To Prearchive” link anchored to the bottom of dropdown
* Clicking on a card will take you directly to the **Archive Session Detail** page
  + If the entry is not in an error status, clicking on the card will take the user to the Prearchive page with the appropriate filters applied so that it is the only entry visible.
* This dropdown will show the 8 most recent items uploaded to the Prearchive.

## Prearchive page

Three main sections: **Filters**, **Sessions**, **Details**

### **Filters**

* There will be a collapsed and expanded view for the Prearchive filters.
* Use the same filters available to XNAT 1.5:
  + **Project** (AutoComplete/Dropdown)
  + **Subject/Session** (AutoComplete/Dropdown) – requires valid entry in **Project** field
  + **Upload Date** (Date Range)
  + **Scan Date** (Date Range)
  + **Status** (Dropdown):
    - Ready
    - Receiving
    - Error
    - Archiving
    - Building
    - Moving
* The filters do not require a “Run this Filter” button or action. Filtering is triggered as each field is entered.
  + The philosophy here with this UI filtering pattern is that the user may be able to locate what they are looking for as they are forming the query, and therefore not have to provide as much detail as they might otherwise. Also, this allows lateral scanning of associated data, so users are seeing more of the surrounding data as well. Ideally, this is also an area where the multiple search re-querying will not be too expensive.
* Initially unexpanded, unless filters are applied to the page, for example if the user has navigated to the Prearchive by choosing an individual card in the Prearchive dropdown in the Site Navigation.
* The filter console when expanded will have a link to “Clear Filters and Collapse.”
* You cannot collapse an active filter box without clearing the existing filters.

### **Sessions**

* Need clarification on what “Views” are and how important they are.
* Changes from XNAT 1.5:
  + Select All/Unselect All will now be represented as a single checkbox in the table header row.
  + Rows in the table are selectable, and there will be an action button in the action bar above the table that allows users to “Check Selected (#)”
  + Reuse convention we are establishing for Data Tables, where we minimize the number of actions hidden within a dropdown: individually display “Archive”, “Move”, and ”Delete” buttons in the action bar.
    - These action buttons will be inactive if no rows have been checked and will only apply to items which have been checked in the table (not selected) (Important distinction between “Selected” and “Checked”)
    - Archive is called out as the primary action in the table
  + Actions
    - Archive
    - Move - ???
    - Delete
* Columns identifying each Session in the table remain consistent with XNAT 1.5:
  + Project
  + Subject
  + Session
  + Scan Time
  + Upload Time
  + Status

### **Details**

* Updates with selections made within the **Sessions** widget
* Two views: “Single item selected” and “Multiple items selected” from the **Sessions** widget
* Single item is selected
  + Details will include:
    - **Project Name**
    - **Session ID**
    - **Session Date** (format: YYYY-MM-DDTHH:MM:SS)
    - **Upload Date** (format: YYYY-MM-DDTHH:MM:SS)
    - **Status** (with appropriate color coding and status specific styling)
  + Actions, represented as an abbreviated “Command Ribbon”
    - Archive
    - Move
    - Delete
    - Reset
  + “See More Details”, which, when clicked will direct the user to the **Archive Session Detail** page. The button will be captioned by explanation text that reads “View DICOM headers and basic scan image previews”
* Multiple items have been selected
  + The Details will show how many items are selected (i.e. “6 items are selected”)

## Archive Image Session

This page is accessed from the Prearchive page and from the Prearchive dropdown menu in the site navigation.

A lot of the functional requirements of this page will be addressed in the User Interface Guidelines for Form Components document. Some unique features of this page are highlighted below:

* The Scans section will largely be pre-populated when the user arrives at this page, depending on how the Session reached the Prearchive.
* Scans designated as “Usable” are automatically flagged for processing by the project pipelines after it reaches the Archive.
* Scans designated as “Questionable” also need to be automatically flagged for processing by the project pipelines after it reaches the Archive (in XNAT 1.6-, scans flagged as “Questionable” are automatically unchecked when it reaches the pipeline processing page)
* Scans designated as “Unusable” will not be added to the queue for the pipeline processing.

This page will also serve as a way for the user to check for PHI using the “Preview DICOM Headers” utility. The utility will open in a modal, using the existing workflows already defined by the NRG for the DICOM browser.

# Other Pages

## “More Actions”

Will aggregate the actions available to [XNAT], including the default, official actions as well as third-party ones that the site administrator has configured for [XNAT].

Display will be grouped according to the categories previously defined for the XNAT Marketplace website:

* Admin
* Datatype
* Display
* Pipeline
* Apps
* Integration
* Scripts
* Other

Because modules can be classified in multiple categories in Marketplace, this “More Actions” page will also allow actions to appear in multiple categories as well.

Reference: Google “More” page: <http://www.google.com/intl/en/about/products/index.html>

## Account Settings

Account Settings is accessed by clicking on the Username in the upper right corner and selecting “Account Settings” from the dropdown menu. This is where users can update their basic profile information (anything collected during the registration process).

* Username is NOT editable.
* All fields provided by the user during registration will be prefilled.
* Save Changes reloads page with confirmation notification.

Users can also manage which projects they are a part of.

* This is necessary because it was decided for the Users section that “Adding” existing XNAT users to a project does not require them to accept the invitation.
* The interface on Account Settings allows users to “Leave Projects” that they have been incorrectly invited to or no longer want to be a part of.

Accessed through the user dropdown in the site navigation.

## Login

If a third-party authentication service has been set up for an instance of XNAT, this will potentially add a logo and custom message related to the service in the Login box. For example, the WUSTLKey service has a graphic of a key and a tagline which will appear on the CNDA.

### Page Components

#### Login box

“Username” and “Password” text fields

Forgot Username or Password?

* AJAX motion, NOT a page reload
* Offers user chance to enter email address to request username or enter username to request password
* Same with the “Back to Login Screen” button
* Description of the instance of XNAT
* Live twitter feed highlighting status of [XNAT]

It was decided that the login page does not require an “Authentication Type” dropdown, even if third-party options are available, as the XNAT platform will be able to handle the Username/Password combinations intelligently requiring user input for the extra field.

## Register

Purpose of the page is to allow new users to register for [XNAT].

Factors that will affect the layout of the page:

* The third-party authentication options configured for this [XNAT]
* There is also a different layout for when NO other authentication/registration options have been configured for [XNAT] (this default registration option is called “Local Database”)
* Will usually be one, but the possibility exists for multiple third-party authentication options.

## Register with Project Invitation email

Users who are invited to a project through an email address that does not correspond to an existing [XNAT] account will receive a unique URL string for a registration page tied directly to the project he/she is being invited to (for the purposes of the PAR? class).

All functionality available on the “Register” page is also represented on this page, but there are a couple of additional features:

Because part of the email invite workflow is to offer users the chance to change the email address they want to user for [XNAT] or to accept the project invite with an existing [XNAT] login, the following options are available:

* Large text at top of page indicating the project that the user is being invited to join.
* The option to “Accept project invitation with existing account”, located above the Register an Account form.

# **Other Features**

## **Communication**

1. **System alerts – between site admin and users**

* **Communicate known issues with the system. Keep users “in the loop”**
* **Will show up on the Global User Dashboard**
* **Communicate scheduled maintenance or downtime**

1. **Project alerts – between project leaders and members**
2. **Manual Task Notification – between individual project members, between leaders and members**
3. **Status Notification – from XNAT system to selected project members regarding automated tasks**

## Notifications

Notifications will appear as “floating” (e.g. outside of normal document flow), directly below the fixed site navigation (so that it is always directly underneath the navigation, since the navigation follows the user as he/she scrolls down the page)

There are two classifications of Notifications:

* Warning – Requires the user’s attention. Can only be closed manually.
* Alert – Useful feedback for the user, but not necessary for the user to directly address. Will fade out after a certain amount of time. Generally, used for success messages (e.g. “Your pipeline was run successfully”).

Notifications must also be stackable, as there exists the potential for many notifications being active at once.

Integrity’s recommendation is to define a standard for aggregating notifications, so that developers do not trigger the possible scenario of 100 active notifications that the user must close.

# Help and Training (Out of Scope)

### Deployment Requirements

1. Many instances of XNAT

### Help Features

* Opens a new window
* XNAT Ontology
* Hinting throughout XNAT through the use of tooltips and other guiding elements

# Reports (Out of Scope)

# **Download Images (Out of Scope)**

# Upload Images (Out of Scope)

# Image Viewer (Out of Scope)

# File Manager (Out of Scope)