

BREAST Research Portal

Functional Specification Document

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VERSION CONTROL

Version	Approved Date	Comments	Approved By
1.0	09-Apr-2015	First Version	Carmina Tapia

REVISION HISTORY

Version	Author Name	Date	Description of Change
1.0	Monica Llamas	02-Apr-2015	First Version
0.3	Christabelle Pabua	30-Mar-2015	Revise – Additional designs to complete application workflow
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EXECUTIVE SUMMARY

BreastScreen Reader Assessment Strategy (BREAST) is an educational tool and resource for research in detecting breast cancer through screen-reading digital mammography. Its main objective is to advance and improve detection of breast cancer in Australia through research and training.

BREAST is comprised of 1) enriched mammographic test sets displayed on clinical grade workstation monitors, and 2) an online software that allows clinicians (“users”) to assess their skill in detecting lesions in the test sets. 1 and 2 are separate systems that users navigate simultaneously, that is, while viewing the test sets in high resolution screens, users record their answers to the test set in an online system. Currently, BREAST is using the ZILTRON software, an online self-assessment tool that provides users with immediate feed-back in real time. ZILTRON collects de-identified readings from users of different ages and levels of expertise, which can be used for research later on.

BREAST generates a large amount of data in the form of mammography images and lesion characteristics that are collected from BreastScreen NSW and used in the test sets, and user input collected by ZILTRON. The data is currently stored in spreadsheets and images filed in a physical drive. Both images and data are manually provided to approved researchers upon request. Below is a list of drawbacks in using this method:

1. The current process highly depends on individuals, which may delay response time and processing due to availability of personnel.
2. Lack of information security.
3. Duplication of entries.
4. Time consuming and costly to produce required data to researchers.
5. Prone to errors in delivering required data to researchers

One of BREAST’s aims is to enable expert assessment of mammography images and reader characteristics, regardless of geographical location. Currently, innovations are being assessed by limited numbers of individuals who are geographically located near the innovation, resulting in equivocal studies with low statistical power. In order to transform this current paradigm and attract more researchers in Australia and beyond, BREAST must utilise the power of technology and the Internet.

Definition of Terms

No	Term	Definition
1	Analytics	Analytics is a process of systematic analysis of data and convert it into an informational insight to help make better decisions.
2	Content Management System (CMS)	Content management is a computer application that allows publishing, editing and modifying content as well as maintenance from a central interface.
3	Connectivity	Connectivity is the ability to make and maintain a connection between two or more points in a telecommunication s system.
4	User Journey	A user journey illustrates the path that a user may take to reach their goal when using a particular website/application.
5	Use Case	Use case is a methodology used in system analysis to identify, clarify, and organize system requirements.
6	Application Flow Diagram	Application Flow Diagram represents the transaction flow within an application.
7	Idle Mode	Is a state of an application described as not being used by a program for a pre-determined continuous amount of time (i.e. 3 minutes)
8	Landing Page	Landing page is the default page that the user will see after accessing the URL/link of a website/application.
9	Text Box/Text Field	A text box is an area in the user interface where user can type.
10	Pop-Up Window	Pop-up window is a new browser window that will appear over the active window.
11	Grid	Grid is a representation of data in tabular form.
12	Filter	Filter is a function that will process a data structure (i.e. list) in some order to produce a new data structure.
13	Sort	Sort is a function that will arrange data in ordinal form.

GOALS and OBJECTIVES

Project Goals

The BREAST Research Portal aims to:

- Build a single, robust, and secure repository (database) for all research data.
- Management of data distribution.
- Provide easier access to BREAST's research data to current and potential researchers.
- Reduce time and costs spent in correspondence between researchers and BREAST.

PRODUCT SCOPE and EXPECTATIONS

Scope Definition

This section covers the overall scope of the project, which are discussed thoroughly in the following sections:

- Functional Scope
- Data Scope
- Connectivity Scope
- Technical Scope
- Geographical Scope
- Organizational Scope
- Out of Scope
- Assumptions
- Constraints.

Functional Scope

The BREAST Research Portal will allow end-users, mostly researchers, to contact the BREAST project team for any inquiries they may have. They can also register to gain access to test sets, images, raw data and readings, which they can download and use for their research.

The BREAST Research Administrator will be able to maintain the database by importing the most recent data. The administrator will also be able to view inquiries from end-users, track requests (registration) from end-users for approval and use a feature that will enable them to manage the registered end-users.

ACTOR	GOAL	BRIEF
User	Inquires about the service	User will choose the “Contact Us” Option for any inquiries they have.
User	Read about what the BREAST Research Portal is about.	Information about the portal will be in the Landing Page.
User	Register to access the BREAST Research Portal data.	User will submit a Digital Registration Form to be able to gain access and use the information available. Once approved, user can search the required information needed.
User	Download required files.	Images and information in spreadsheets or in PDF format can be downloaded.
Administrator	Maintain database content	Import recent data into the database
Administrator	View and Approve/Reject Pending Registration	Approve or Reject end-user requests or registration

Data Scope

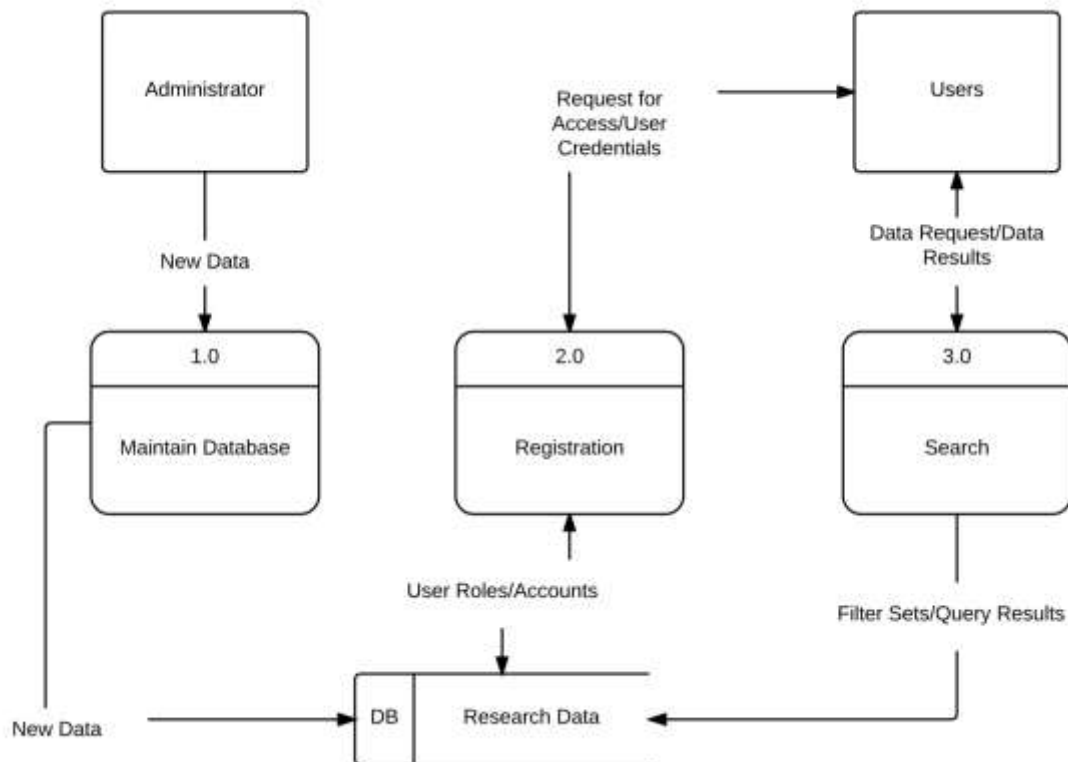


Figure 1 – Data Scope Diagram

Connectivity Scope

All data in the BREAST Research Portal is from BREAST. The end-user sends a request through their personal computers, which will then fetch the data from the BREAST Research Portal database housed in AWS, a cloud server. The database in the AWS server sends results back to the end-user through the BREAST Research Portal accessed through their personal computers.



Figure 2 – Connectivity Diagram

Technical Scope

- The application is designed to operate on the latest version of Internet Explorer, Google Chrome and Safari.
- Network connection is required to access full features of the application.

Geographical Scope

The application is designed and built to function globally as long as there is Internet connection and a compatible browser. The BREAST Research Portal will be maintained in Australia only.

Out of Scope

This project does not include:

- Integration with the organisation's existing application.
- Extraction of data from other BREAST Applications.

Assumptions

The following assumptions were made:

- Existing information will be available ready for initial loading. To be provided by BREAST.
- The BREAST Research Portal will not be interfaced to any of BREAST's existing applications.
- Data processing is out of scope.
- Adequate resources such as people, hardware, and software will be available and committed to this project.

Constraints

- Testing will only be done in Australia and the Philippines due to limited resources.
- Data to be loaded into the system will be in a spreadsheet format.
- Images will be loaded in JPEG Format/DICOM format.

USE CASE

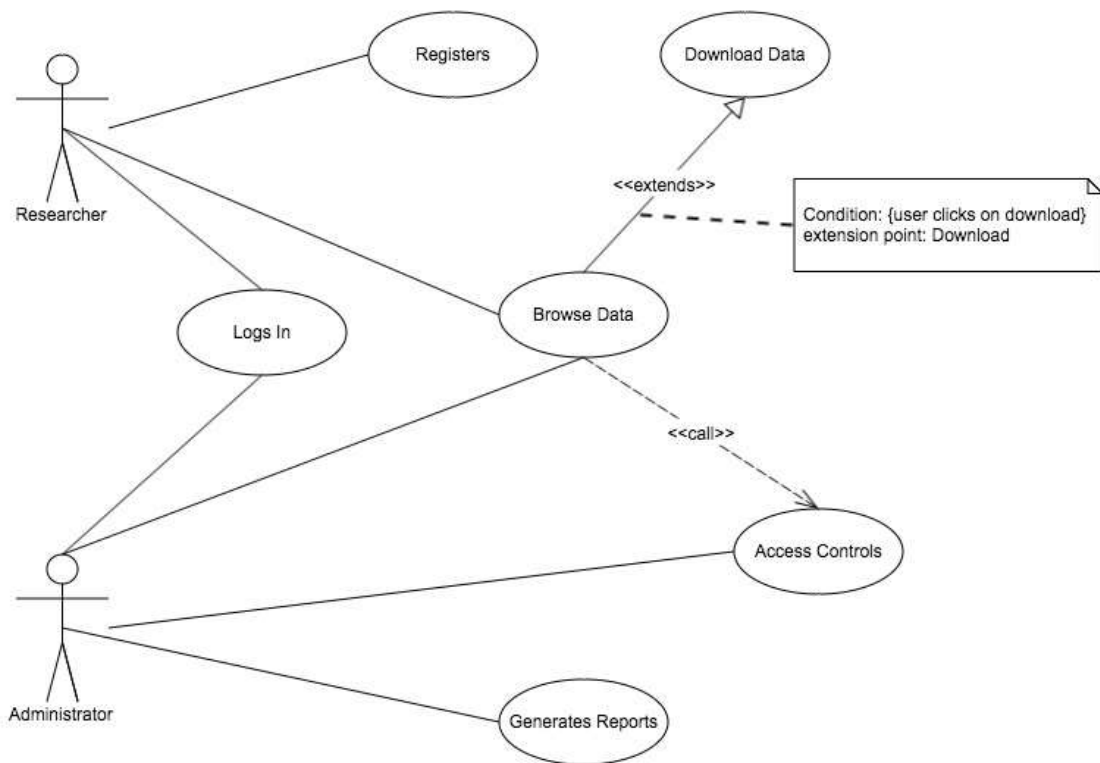


Figure 3 - Use Case Diagram

APPLICATION FLOW DIAGRAM

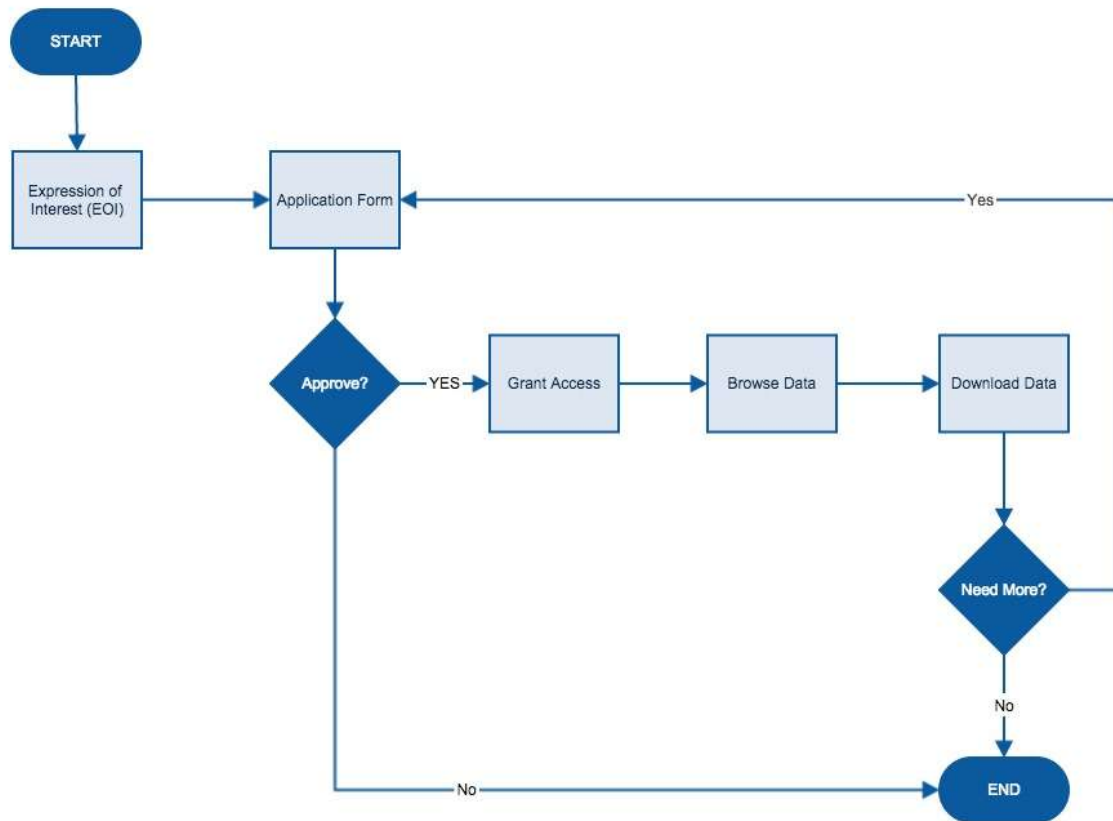
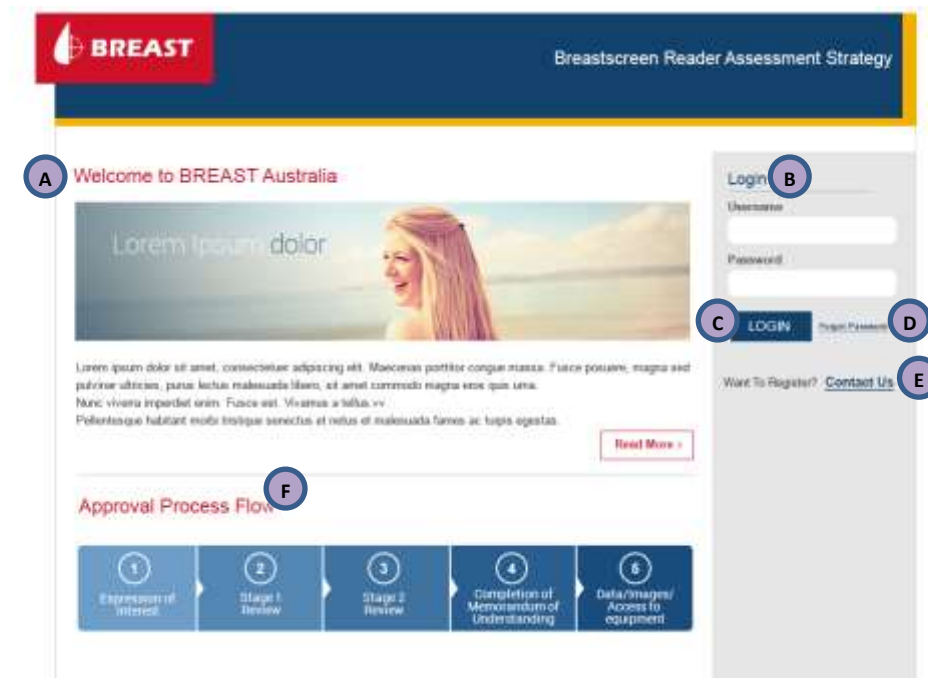


Figure 4 - Basic Application Flow Diagram

APPLICATION FEATURES

HOME PAGE



- A. **Welcome to BREAST.** This is an About Us section. It will explain what the BREAST Project is all about and what information it can provide.
- B. **Login.** Login is required to use the application. **Username** will be the nominated email address of the user.
- C. **Login Button.** Clicking this button will validate the credentials provided by the user. When credentials provided are valid, the user will be redirected to the Main page (Landing page) of the Research Portal. When the user provides an invalid credential, the application will deny access to the Research Portal and inform the user of the failed validation then let them try again.
- D. **Forget Password.** In the event that the user cannot remember his/her password, user can reset the password. Request to change password and instructions will be sent to the users nominated password.
- E. **Register.** To use the Research Portal, users need to register. Users need to contact Program Administrators by sending an Expression of Interest to begin the registration process.
- F. **Approval Process Flow.** This is the diagram of the program's approval process. It is displayed in this page to give the users a glimpse of the steps they need to go through to register.

CONTACT US

The image shows a screenshot of the BREAST Research Portal. A modal window titled "General Inquiry" is open in the center. The modal has a title bar with a close button (D). The form fields are labeled A: Fullname, Email Address, Contact Number, Subject, Message Type (dropdown), and Message (text area). At the bottom are "Cancel" (B) and "Submit" (C) buttons. The background shows the portal's header with the BREAST logo and "Breastscreen Reader Assessment Strategy" text, and a sidebar with "Welcome to BREAST" and "Approval Process" sections.

- A. **Fields.** These are the information that a user needs to provide when sending any inquiry to the Project Team.
- Full Name
 - Email Address
 - Contact Number – this is an optional information
 - Subject
 - Message Type – at this stage, the identified types are as follows:
 - Expression of Interest – to formally request for access in the Research Portal
 - New Request – request to view and download additional information
 - General Inquiry – any other inquiries
 - Message
- B. **Cancel Button.** Cancels sending the message. Closes the form.
- C. **Submit Button.** Sends the message to an Administrator nominated email address. Closes the form.
- D. **Close Button.** Closes the form.

REGISTRATION

Step 1 of 6 – Project Title

The screenshot displays the registration interface for the BREAST Research Portal. The header includes the BREAST logo and user details (John Doe) with links for 'My Account' and 'Logout'. A progress bar at the top indicates the current step is '1 Project Title' out of six. The main form area is titled 'Application of Access' and contains two sections: 'Project Title' and 'Chief Investigator's Details'. The 'Project Title' section has a single text input field. The 'Chief Investigator's Details' section includes multiple input fields for personal and professional information. At the bottom right, there are 'Save' and 'Next' buttons.

- A. **User Info.** Once logged on, User Info is displayed in this section.
- B. **My Account.** Redirects user to Profile page where they can modify their details and password.
- C. **Logout Button.** Logs out the user.
- D. **Application Steps.** Informs the user how many sections they need to fill to complete the Registration Process. Current section that the user is working on is highlighted with blue colour.
- E. **Required Information.** Necessary to be filled out accordingly to proceed to the next section.
- F. **Save Button.** Whenever the user feels the need to continue working another time, this will save their progress. When they re-login next time, they will be redirected to the section they ended the last time.
- G. **Next Button.** When clicked, the application will validate the required information. When everything is filled up accordingly, user will be redirected to the next section. Otherwise, information that needs to be filled-out or corrected will be highlighted to let the user know which information needs their attention.

Step 2 of 6 – Project Information

BREAST BreastScreen Reader Assessment Strategy

John Doe My Account Logout

A ← Application of Access

1 Project Title 2 **Project Information** 3 Funding 4 Resources Required 5 Certification by Applicant 6 Applicant Checklist

Research Project Information

C 1. Summary of research project in lay language (maximum 200 words)

B 2. Research Plan Information

Project Methodology

Data Request

Number of readers from whom data are requested:

Type of Case: Number of Cases:

Equipment:

Statistical Justification:

3. Start Date and End Date

Start: End:

4. Other researchers collaborating on project

Fullname: Department: Institution:

Add Save Next

D **E**

- A. **Back Button.** Redirects the user back to the previous section.
- B. **Current Section.** Current section being worked denoted by the blue background colour of the button.
- C. **Required Information.** Necessary to be filled out accordingly to proceed to the next section.

- D. **Save Button.** Whenever the user feels the need to continue working another time, this will save their progress. When they re-login next time, they will be redirected to the section they ended the last time.
- E. **Next Button.** When clicked, the application will validate the required information. When everything is filled up accordingly, user will be redirected to the next section. Otherwise, information that needs to be filled-out or corrected will be highlighted to let the user know which information needs their attention.

Step 3 of 6 – Funding



BREAST Breastscreen Reader Assessment Strategy

John Doe My Account Logout

← Application of Access

1 Project Title 2 Project Information **3 Funding** 4 Resources Requested 5 Certification by Applicant 6 Applicant Checklist

Funding

1. Have you secured funding for the research project?

☐ Yes ☐ No ☐ Pending

2. If "Yes" or "Pending", please detail the funders who have approved or are considering your project.

Funding Body Length or approved funding period in years Funding Amount in Australian Dollars

3. If you haven't secured funding, what is the status of your research project?

Please provide details below (maximum 200 words):

B / U Print

Ethics

1. Do you have Human Research Ethics Committee (HREC) approval to conduct this research project?

☐ Yes ☐ No ☐ Pending

A **B**

Save Next

- A. **Save Button.** Whenever the user feels the need to continue working another time, this will save their progress. When they re-login next time, they will be redirected to the section they ended the last time.
- B. **Next Button.** When clicked, the application will validate the required information. When everything is filled up accordingly, user will be redirected to the next section. Otherwise, information that needs to be filled-out or corrected will be highlighted to let the user know which information needs their attention.

Step 4 of 6 – Resources Required

BREAST BreastScreen Reader Assessment Strategy

John Doe My Account Logout

← Application of Access

1 Project Title 2 Project Information 3 Funding 4 Resources Required 5 Certification by Applicant 6 Applicant Checklist

Resources Required

What BREAST resources do you require for your project?

Images Reader Data Number of Participants

Reader Data

Reader Type

☐ General radiologist
☐ BreastScreen radiologist
☐ Registrar / Fellow
+ Add

Reader Data

Reader Type

☐ Pathology Slide Scanner
☐ Mammography Pacs Workstations
☐ Other Equipment
+ Add

Any additional questionnaires or surveys intended for distribution to participants by BREAST MUST be supplied for review by the management team.

Please add additional questions with description:

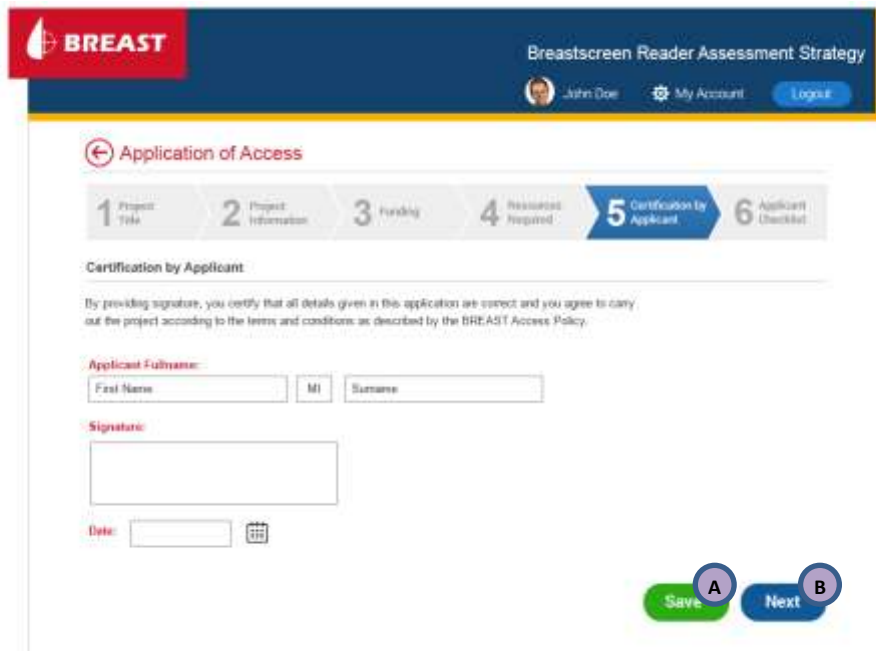
Question	Description

Add

Save Next

- A. **Save Button.** Whenever the user feels the need to continue working another time, this will save their progress. When they re-login next time, they will be redirected to the section they ended the last time.
- B. **Next Button.** When clicked, the application will validate the required information. When everything is filled up accordingly, user will be redirected to the next section. Otherwise, information that needs to be filled-out or corrected will be highlighted to let the user know which information needs their attention.

Step 5 of 6 – Certification by Application



BREAST Breastscreen Reader Assessment Strategy

John Doe My Account Logout

← Application of Access

1 Project Title 2 Project Information 3 Funding 4 Resources Required 5 Certification by Applicant 6 Applicant Checklist

Certification by Applicant

By providing signature, you certify that all details given in this application are correct and you agree to carry out the project according to the terms and conditions as described by the BREAST Access Policy.

Applicant Fullname:

First Name MI Surname

Signature:

Date:

Save A Next B

- A. **Save Button.** Whenever the user feels the need to continue working another time, this will save their progress. When they re-login next time, they will be redirected to the section they ended the last time.
- B. **Next Button.** When clicked, the application will validate the required information. When everything is filled up accordingly, user will be redirected to the next section. Otherwise, information that needs to be filled-out or corrected will be highlighted to let the user know which information needs their attention.

Step 6 of 6 – Applicant Checklist

BREAST Breastscreen Reader Assessment Strategy

John Doe My Account Logout

← Application of Access

1 Project Title 2 Project Information 3 Funding 4 Resources Required 5 Certification by Applicant 6 Applicant Checklist

Applicant Checklist

Please mark the check boxes to confirm you have attached/included all of the required documentation and information.

Documents to be attached to application:

	Yes	Pending	NA
CV of Chief Investigator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proof of funding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Copies of any questionnaires or surveys you wish to have BREAST distribute to a participant group	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ethics

For projects with pending ethical approval:
 (a) If an ethics submission is already in deliberation, please see attach:
 - a copy of all relevant Ethics Applications you have made for the research project, and
 - any reviewer comments you may have received.

	Yes	Pending	NA
- a copy of all relevant Ethics Applications you have made for the research project, and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- any reviewer comments you may have received	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

For projects with ethical approval:
 (b) If Ethics Approval has already been granted by any HRE CURS for this project, please attach:
 - a copy of the approved Ethics Application
 - letter(s) of Ethics approval, and
 - all approved documents for the research project

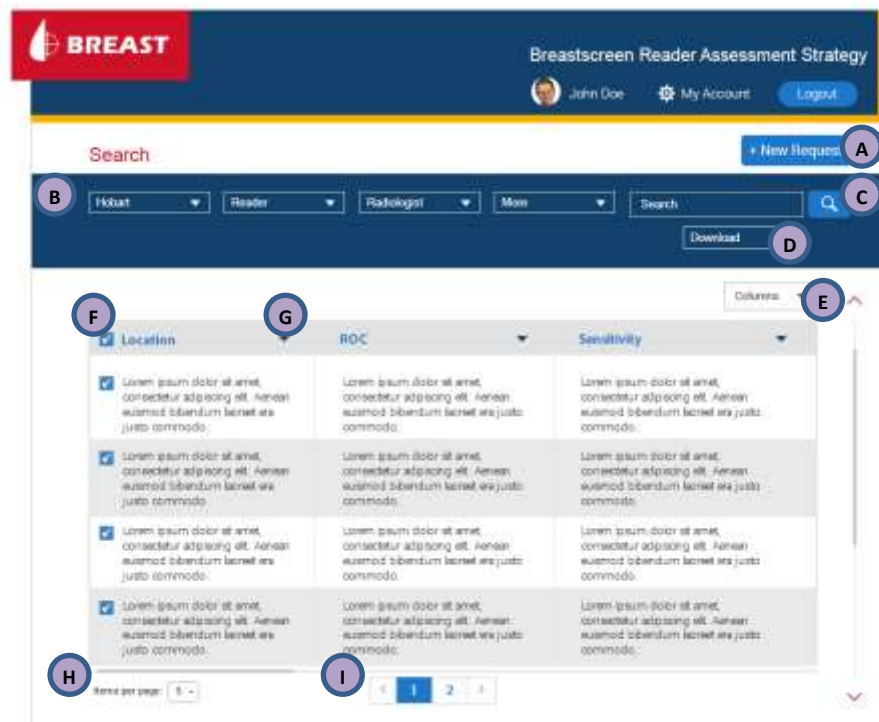
	Yes	Pending	NA
- a copy of the approved Ethics Application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- letter(s) of Ethics approval, and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- all approved documents for the research project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Save Submit **A**

- A. **Submit Button.** Submits the application to BREAST Project Manager. On click of the Submit Button, an email notification will be sent to nominated approver.

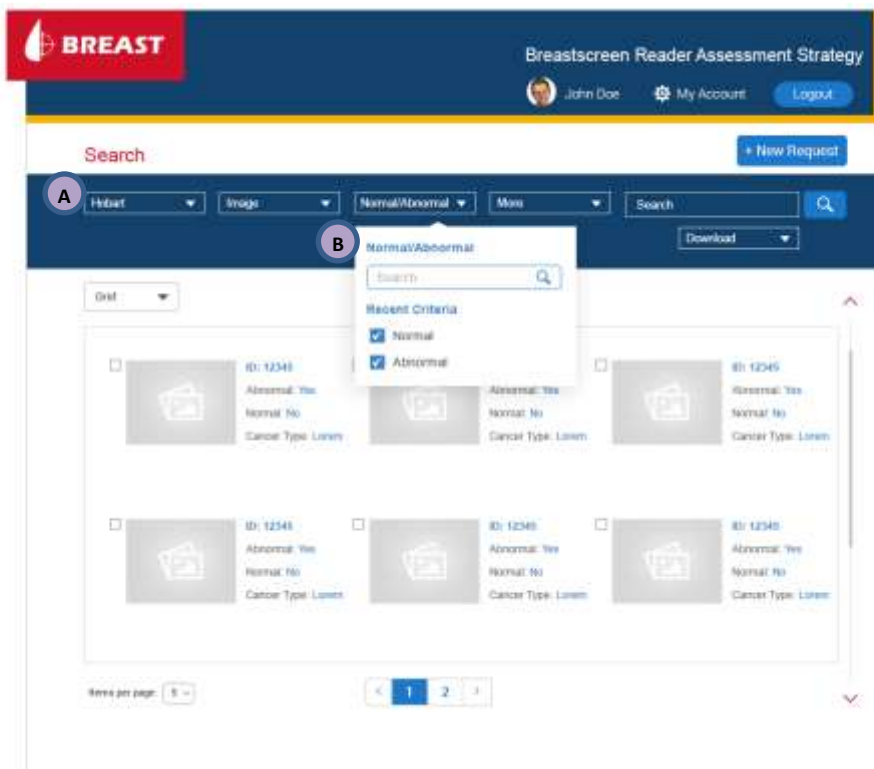
SEARCH

List View - Readers



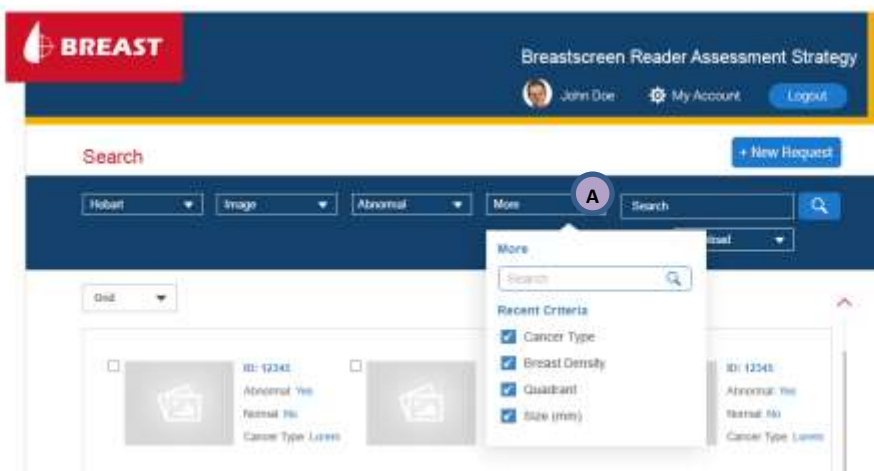
- A. **New Request Button.** Enables the user to inform the Program Administrators of additional information that they need.
- B. **Filters.** Filters shortlists search results (F) according to the need and preference of the user.
- C. **Search Button.** Searches the portal for a data or image that matches the keyword entered by the user.
- D. **Download Button.** Downloads the data/image in format chosen by the user. It give the user the option how to download the selected information, either through Google Drive, Dropbox, FTP, or the default download of the browser used.
- E. **Columns Button.** User can choose what column will be displayed in the search result area (F).
- F. **Search Result.** By default, data displayed is the non-image type of information that current user can view.
- G. **Sort.** Clicking the column header will sort the results accordingly.
- H. **Items per Page.** Users can decide how many information are displayed in each page.
- I. **Pagination.** Indicated the total number of pages for the current search criteria. Allows the user to move from one page to the next.

Filtering



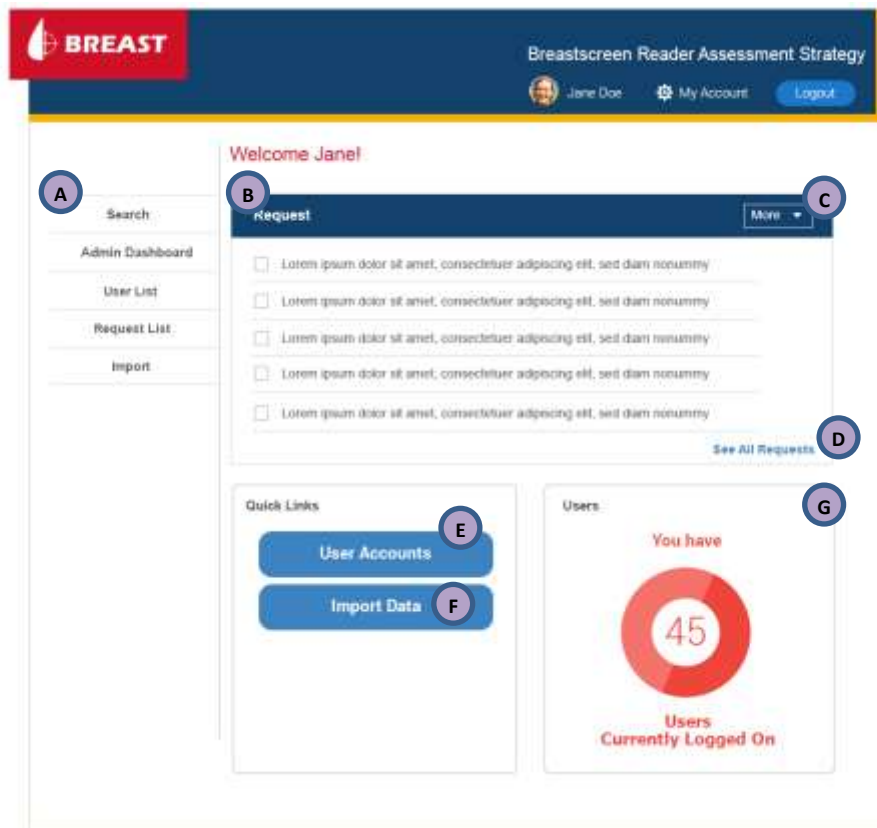
- A. **Filter.** Filters helps user to shortlist the search results. Test Sets and File Type are fixed filters.
- B. **Additional Filters.** An added criteria to shorten the list whenever necessary.

More Option



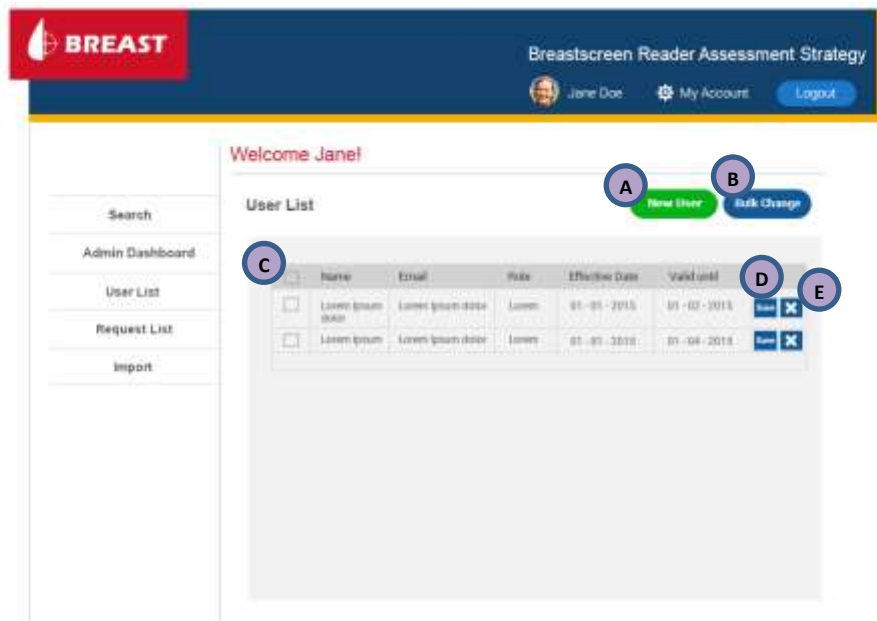
- A. **More.** Enables the user to add more criteria if they want a more refined search. This option will be dependent on the **File Type** selected.

ADMINISTRATION – Dashboard



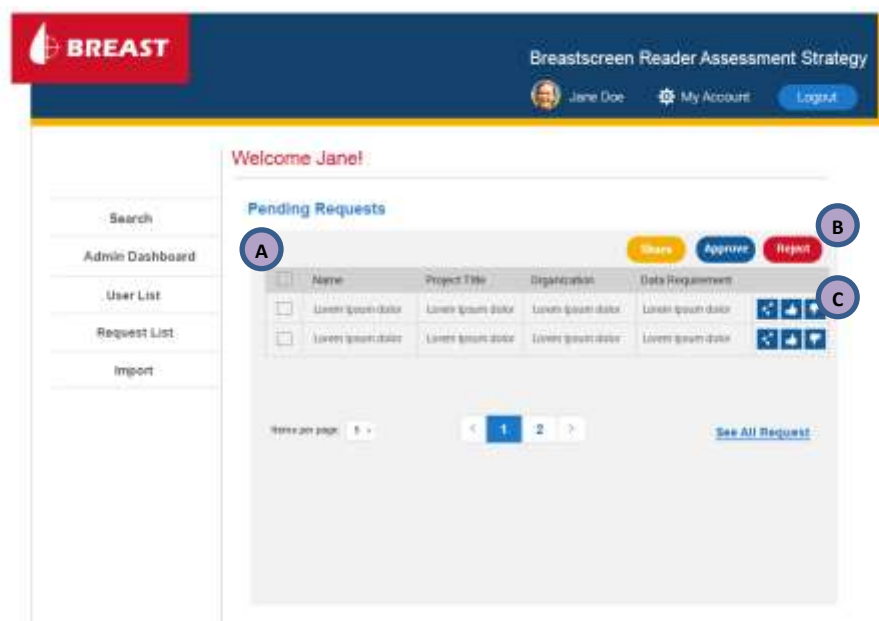
- A. **Menu.** This section displays the function that an Administrator of the Research Portal can do.
- B. **Request List.** Lists five (5) recent Access Request.
- C. **More Button.** Filters the Request list according to Status. By default this list only displays Pending applications.
- D. **See All Request link.** Redirects Administrator to the Request List page.
- E. **Quick Links - User Accounts.** Displays create user page to enable the Administrator to quickly create new users.
- F. **Quick Links - Import Data.** Loads data in the database of the Research Portal.
- G. **Current User Count.** Let the Administrator view current users logged on.

ADMINISTRATION – Users List



- A. **New User Button.** Create new user accounts.
- B. **Bulk Change.** Allows the Administrator to change multiple user accounts' Role assignment and Expiry Date (Valid Until).
- C. **User List.** Tabular view of User Account information
- D. **Save Button.** Updates User Account changes for the selected user account.
- E. **Deactivate User Button.** Sets Valid Until information for the selected user account.

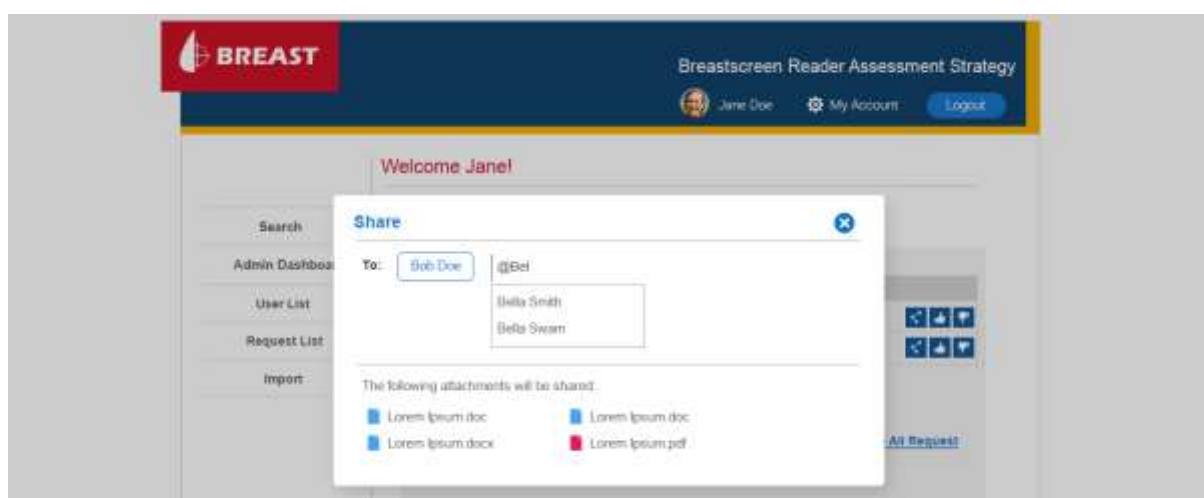
ADMINISTRATION – Request List



- A. **Pending Request List.** List of all pending request that needs action from the Administrator.
- B. **Action Buttons (Multiple Selection).** There are 3 action buttons available. (1) **Share by Email** lets the Administrator to share the information to other parties in their distribution list, (2) **Approve** is granting the applicant access to the Research Portal, and (3) **Reject** is denying access in the Research Portal.
- C. **Action Buttons (Single Selection).** It has the same feature as actions listed in previous (C). But as opposed to applying action to all data that is selected, using this buttons will only apply action to the row or data selected.

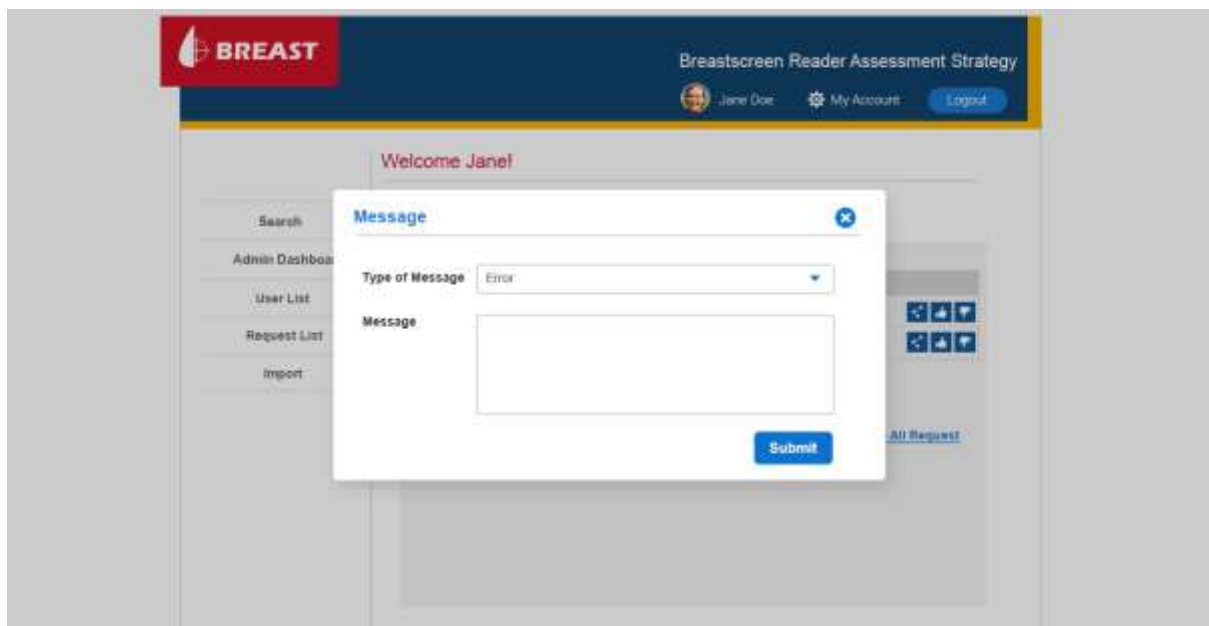
Share by Email

Administrators can share Application via Email. They just need to type in the email address of the person included in their distribution list.



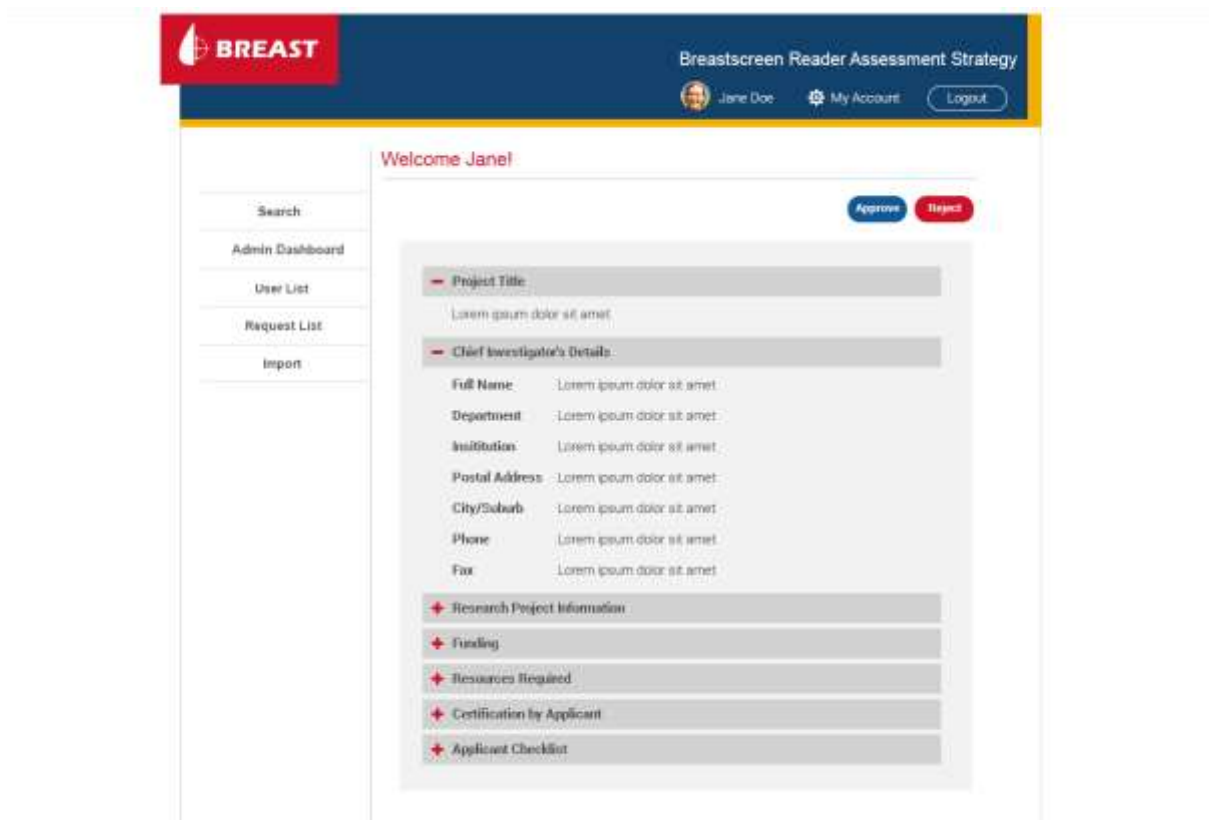
Disapprove Application

Whenever an application is rejected, the Administrator needs to provide the user reason why their application is rejected.

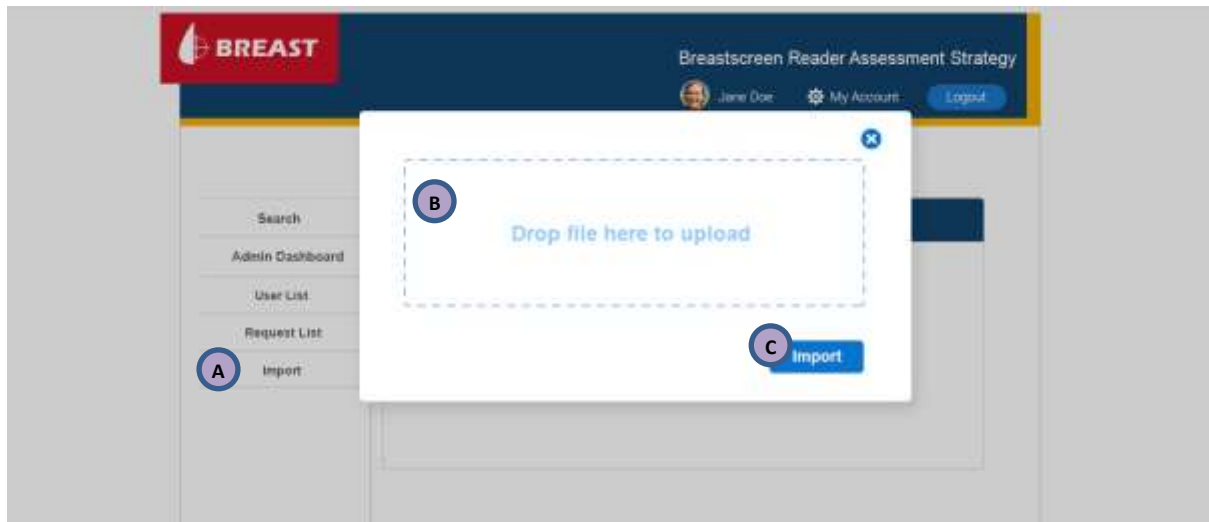


Request Details

Administrators can view the details of a request by double-clicking an application from the Request List. In this view, the Administrator can already Approve/Reject an application in this page.



ADMINISTRATION – Import Files



- A. **Import.** Loads data in the database of the Research Portal.
- B. **File Drop Area.** Files to be uploaded are dragged or dropped in this area.
- C. **Import Button.** Verifies the file and starts import once validation is successful.

CHANGE REQUEST

Any change to the project scope, assumptions, application features, and/or technical changes that may impact the project schedule or cost will be identified using the Change Control Process. It will be reviewed by both BREAST and the BREAST IT Project Team. This review will be used to determine the impact of the change on the overall Project. The Change Control Process listed below will be used for all changes within the project

- Change Initiation/Request
- Change Validation and Impact Analysis
- Time and Cost Estimate Preparation
- Change Approvals
- Change Implementation

Either BREAST or BREAST IT Project Team may initiate a change request. The reason for a change can include, but are not limited to, BREAST's requests, regulatory changes, and changes to technical scope or other technical issues reported by both parties.

The change request form will be completed by the party requesting the change and must require approval from BREAST prior to implementation. In the event that the proposed change causes an increase or decrease to the agreed price, the agreed price shall be increased or decreased by the BREAST IT Project Team.

APPROVAL

I hereby confirm that I have carefully read and understood the provisions of the scope of work for this project. Also, by agreeing I hereby acknowledge and agree to comply with or be bound by the provisions stated in this document.

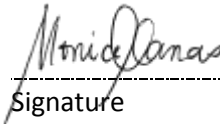
Name of BREAST Representative

Signature

Date

MONICA LLAMAS

Name of IT Project Team Representative



Signature

11-April-2015

Date