# Capture Functions Requirements

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## 1.0 Purpose

The purpose of this document is to describe the requirements for the image capture process. The requirements include not only the capturing of the images, but the functions that are necessary before, during and after the capture process.

## 2.0 Scope

The scope of this document consists of the Capture Function processes as a whole, no other systems requirements are defined in this document. The initial release of this document addresses only the requirements for the core system; this will be augmented as new requirements are introduced.

## 3.0 Definitions

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|---|---|
| **Bitmap** | A graphic format used by the system. All images captured by the system are stored in this format. The images are all captured at a resolution of 320 pixels by 240 pixels |
| **Pixel** | A graphical component that has the ability to turn on and off and display color and intensity. |
| **Energized Image** | The image capturing the energy that is evoked from the finger when the voltage is applied to the plate. |
| **Finger Image** | The raw image of the finger captured before the voltage is applied to the plate. |

## 4.0 System Requirements

### *General*

**4.1** The capture functionality should be available to any authenticated user of the ClearView system.

**4.2** The capture must save the images in a 320 pixel wide by 240 pixel high Bitmap format image.

**4.3** All images must be stored in the database, not on the file system. The file system can be used for temporary storage or calculations.

**4.4** All energized images, lit finger images, raw data and reported final data points are stored in the database. An audit trail will be kept for each datapoint stored in the database consisting of the following tracking points:

- ID of the user that performed the image capture and initiated analysis.
- Date and time of the capture/analysis down to the minute.

***Search Capture***

**4.5** A button should be available in the main menu of the application to search for a capture.

**4.6** The ability to search for a capture should be available to any authenticated user of the ClearView system.

**4.7** The user should be able to search for captures using the following criteria in any combination:

- First Name
- Last Name
- Scan Start Date
- Scan End Date

**4.8** The scan end date should default to no value.

**4.9** The scan start date should default to no value.

**4.10** The capture search results should display the following data in columnar format:

**4.10.1** Patient Name (First and Last)
**4.10.2** Treatment Id
**4.10.3** Version of software the scan was run under
**4.10.4** Run Notes- When a scan is resubmitted, the Run Notes column should contain the verbiage: "Reprocessing of Treatment Id: XXXX"
**4.10.5** Scan Type
**4.10.6** Scan Date- When a scan is resubmitted, the original date of the scan should be saved and displayed in the 'Scan Date' column.
**4.10.7** Archived Flag

**4.11** The default sort order of the list will be by date scanned in descending (most recent first) order.

**4.12** The search results list should be able to be sorted by any of the columns that are displayed in either ascending or descending order.

**4.13** Four functions should be able to be performed from the capture search results dialog:

- Viewing the Report Pages
- Viewing the Calibration Set Images
- Viewing the Capture Images
- Exporting of the subjects information including:
  - Finger Images
  - Calibration Images
  - Raw Calculated Data
  - Report Data
  - Calibration Data

**4.14** Clicking the View Report button will load the report data for the selected patient and capture in the search results grid.

**4.15** Clicking the View Calibration button will display a dialog containing the Calibration images used during the selected scan.

**4.16** Clicking the View Capture button will take the user to a dialog containing the images from the capture that was selected in the search results.

**4.17** Clicking the Export Data button will present the user with a directory search dialog box which will allow them to specify where the export data will be saved for the selected subject.

***New Capture***

**4.18** A new capture button should be available in the main menu of the application to initiate a new capture.

**4.19** A new capture can only be taken if the calibration routine has been successfully completed within the past 24 hours, and no more than 4 hours have elapsed since the last capture. If these are not true the calibration process must be run again.

**4.20** The new capture process must allow the user to select the patient from the system that the capture is being performed on.

**4.21** The user can be located by searching on the following criteria or any combination thereof:

- First Name
- Last Name
- Gender
- Birth date

**4.22** The patient must first be searched on before a "New Patient" button will appear in order to prevent duplicate entry of patients.

**4.23** The search results page should contain the following elements:

- First Name
- Last Name
- Gender
- Patient Id
- Archived Flag

**4.24** The default sort on the new capture search results page will be first name.

**4.25** The search results page should have buttons for three options available:

- Create a new Patient
- Get a new capture for the selected patient
- View the selected patient's demographics

**4.26** Clicking on the 'New Patient' button will take the user to the section of the application where patients are added to the system.

**4.27** Clicking on the New Capture button will take the user to the new capture dialog for the selected individual.

**4.28** The new capture dialog should allow the display of twenty thumbnail images. These will consist of one image per finger for both hands, once for filtered and once for unfiltered.

**4.29** The dialog should display a live preview window which will show a live image of the finger before the energized image is captured.

**4.30** The dialog should show the captured bitmap image after the capture sequence has taken place.

**4.31** The dialog should have information/messaging area on it so that messages can be displayed to the user as necessary during the capture process.

**4.32** The dialog should display a graphical representation of which finger is currently being scanned, as an orientation and verification point to the user.

**4.33** The currently selected image should have a red border around the thumbnail image.

**4.34** The system should automatically calculate the angle of the image as well as the center point of the captured image.

**4.35** The system should draw an oval around the calculated edge of the image.

**4.36** The system should display the angle of the image by drawing a line along the Y axis through the midpoint along the calculated angle. The line should start a few pixels above the drawn oval and extend below the drawn oval for a distance greater than that above the drawn oval.

**4.37** The system should draw a line along the X axis through the midpoint along the angle calculated + 90˚. The line will extend slightly beyond the drawn oval.

**4.38** The oval and lines described above should be placed over the energized image as well as the finger image.

**4.39** Fields should be available on the dialog to edit the angel, the x coordinate and the y coordinate calculated by the system. The calculations must be able to be overridden.

**4.40** If the calculated values are overridden, the center point and angle generated by the user must be reflected in the crosshair axis and oval that is generated over the images.

**4.41** There should be an ability to turn on and off the oval and cross air on the images.

**4.42** The user should be able to select the image to capture by clicking on the thumbnail, this will make the clicked thumbnail the active capture point.

**4.43** When a capture takes place, both the captured finger image as well as the captured energize image will display in the full size boxes. The energized image will also appear in the selected thumbnail.

**4.44** There should be a button to allow the user to return to the live preview in the case where the captured image must be re-captured.

**4.45** The user can select a thumbnail at any time to display both the finger image and energized image that was captured.

**4.46** Three action buttons will always be displayed for the user at the bottom of the dialog:

- **4.46.1** A Close button – This will simply close the dialog.
- **4.46.2** A Capture Image button – This button will begin the capture process for the selected image.
- **4.46.3** A Submit for Analysis button – This button will submit the images collected to the analysis engine to perform the necessary calculations. The button will remain disabled until all 20 images have been successfully collected.

**4.47** An additional button 'Export Images' will be available only to EPIC system administrator users 'administrator'. This button will allow the user to export both the energized and finger images to the file system before an analysis is run.

**4.48** The 'administrator' user may also right click on a thumbnail to manually load an image from the file system. Right clicking on a thumbnail will cause an open file dialog to appear that will allow the user to select an energized image. No finger image will be loaded.

**4.49** The settings for the camera including the configurable values of voltage, brightness and gain should be displayed *(Applies to version 2.0 and above).*

**4.50** The ability to turn on and off the display of the centerpoint of the image and the angle of the image must be available.

**4.51** The system should make an attempt to reconnect to the scanner automatically if communication errors occur.

***View Capture***

**4.52** The view capture dialog should allow the display of twenty thumbnail images. These will consist of one image per finger for both hands, once for filtered and once for unfiltered.

**4.53** The dialog will be loaded with the energized images from the data for the patient that was selected. Although there will be a placeholder for a large finger image, this will remain blank since finger images are not currently persisted.

**4.54** The system should display the saved angle as well as the midpoint values.

**4.55** There will be two buttons available to the user. The first button is a 'Close'. This button will close the dialog and take the user to the main menu. The second button available to the 'Administrator' user only will be 'Resubmit'. Clicking this button will cause the capture selected to be resubmitted to the analysis process

again. The result will not change the original records, but rather create a new set of data resulting from the resubmit process.

***View Calibration***

**4.56** The ability to view the calibration will be available to any authenticated ClearView user.

**4.57** The dialog that appears will display thumbnail images of all ten calibration images that were used for the selected scan.

**4.58** A full size image (320 x 240) will be displayed in the middle of the dialog.

**4.59** Clicking on the individual thumbnail images will cause the image clicked to display in the full size image area, allowing the user to see a full size image of any of the thumbnails.

**4.60** The image that is currently displayed in the fill size image box in the middle of the dialog will have a thumbnail image bordered in red.

**4.61** The patient name will appear at the top of the dialog.

**4.62** A single button will appear on this dialog, it will be labeled "Close" and will close the dialog and take the user back to the main menu.

**Document Revision History**

| Version Number: | Description of Change: | Date: | Updated by: |
|---|---|---|---|
| 000 | Introduction | 5/24/11 | A. Mason |
| 001 | Update Requirements for the following areas:<br>• Add a fourth function, "Export", to the Search Capture function and described the requirements.<br>• Add the requirement that EPIC Administrator users can "Resubmit" data and describe the requirements for resubmission.<br>• Correct the image size described in the View Calibration section. | 8/31/11 | A. Mason |
| 002 | Modify Search Capture section to clarify verbiage required in the Run Notes column of the Search Capture dialog box and to modify "Date Scanned" to "Scan Date" and clarify which date is displayed in this column. Add requirements for electronic records audit trail and number the requirements. | 3/5/12 | A. Mason |
| 003 | Added the requirement to display the camera settings on the capture screen. Added the requirement to be able to turn the finger orientation graphics on or off. | 7/18/12 | A. Mason |
| 004 | Added the requirement that the system should attempt to reconnect to the scanner if communication errors occur. | 7/30/12 | A. Mason |
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