EPIC ™
RESEARCH
DIAGNOSTICS

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Purpose

The purpose of this document is to describe revision history of the ClearView product from the initial placement into the Source Code Control System (SCCS), to the current version of the software.

1.0   ClearView Revision History

The revision history contained in this document is an overview. For any of the versions listed in the table below, and for code submissions to which no new version was created (iterative development changes), the exact files changed as well as the exact changes can be viewed using the SCCS tool. The versions are listed from oldest to newest in the table below:

Version #	Date Established	Changes Made to Codebase
	04/15/2010	Initial check-in of the codebase. Prior to this, the source was not controlled in any type of sccs mechanism.
0.9.4.0	4/30/2010	Modified the software to be able to bring up any patients images on any computer. Implemented a multi-threaded routine to produce the biofield images, so the process is much faster. Before the system would error if the scan was not performed on the machine that the report was being viewed on. Corrected the display of the bi ofields. Modified the capture window to properly display the appropriate buttons based on what role the user was.
0.9.4.1	5/17/2010	Completed the Biofield display page. The biofields are now shown along with all the relevant data. The user can magnify the biofields and display both the color enhanced and the original images.

		The system can now also pull images down for any patient regardless of where the scan was performed (previously this had a concurrency exception).
0.9.5.0	6/7/2010	Converted to the new Matlab routines. These new routines properly calculate the NS value used in the scoring algorithm.
0.9.5.1	6/7/2010	Modified exposure delay from 350 to 110, this results in much stronger and more intense images. Increased the default values for Gain and Brightness Added sector numbers when viewing the images.
0.9.5.2	6/10/2010	Modified the code so that the Brightness, Gain and exposure delay values could be modified through the interface. Added another tool on the menu to access a new page called "Camera Settings". Hooked in the calibration calculation to be able to display the actual calibration information on the calibration administration page. Removed a significant amount of unused "dead" code. Removed executable and generated objects from source control, this was a waste since they can be regenerated, this also made comparisons between versions more complex than it needed to be.
0.9.5.3	6/18/2010	Finished implementation of auto noise detection and added it throughout the application. The system now performs an analysis on the image to determine the proper level of noise to ignore during calculations. Modified code to address what appears to be a random bug with the GDI framework.

		The following line of code:
		mFrameGrabber.GrabFrame().Save(stream, System.Drawing.Imaging.ImageFormat.Bmp);
		
		Was converted into
		var tmImg = new Bitmap(mFrameGrabber.GrabFrame());
		tmImg.Save(stream, System.Drawing.Imaging.ImageFormat.Bmp);
		
		This seems to give the GDI framework time to free the resource and not generate a really helpful "Generic Error" error message.

0.9.5.4	6/21/2010	Added ability to toggle crosshairs during the scanning process. Added the ability to export report data Verified ability to regenerate Matlab Dll from .m codebase.
0.9.6.0	7/6/2010	Modified the number of significant digits that are used for some coefficients from 1 to 2. Modified the way the standard deviation is calculated, it is now 2 pass. Added a routine to clean up files created on the filesystem when the user logs into the app. This runs as a background thread, did it at login to guarantee that files were not in use. Reordered report sections and section details Implemented new orientation process, this new process now uses a regular image of the finger in conjunction with the energized image to determine alignment. Added the related organ system logic & text to the patient report.

		Modified the image loading process to only allow images that were appropriately named to be selected. If the user needs 4L then only images starting with 4L will be selectable.
		Implemented the new calibration routine, this routine now compares all 5 rings to the new specifications supplied by Nancy.
0.9.6.2	7/19/2010	Corrected a problem where the size of the angle was being miscalculated.
		Changed routine that accepts the Matlab calculations to truncate rather than round to 4 decimal places the values.
		Modified the severity index calculations to take into consideration where the coefficient ranks
		Added some debug statements to the calculation process
		Added a score validator spreadsheet to the validation tools for the system.
0.9.6.3	7/23/2010	Modified scoring to use a Z score in the calculation. This simplified the calculation tremendously.
		Reverted the standard deviation to be the way it originally was.
0.9.6.5	7/27/2010	Modified display of NS graph
		** Note, accidently skipped a version number.
0.9.6.6	7/27/2010	Corrected a bug where a value of NaN was being brought in from the Matlab calculations, this caused means and standard deviations to be off. This was a rare case that would occur when an image had no pixels lit in a given sector. The case is

		now properly handled.
0.9.6.7	7/28/2010	Corrected a conversion error that was resulting in a 1/1000 point differential in a calculation on occasion.
0.9.7.0	9/13/2010	Completed biofield mapping (initial design). Modified scoring routine to implement latest coefficient.
0.9.7.1	9/15/2010	Modified calibration routine. Added calibration fail-safe switch
0.9.7.3	9/16/2010	Removed unnecessary biofield total value display
0.9.7.4	9/17/2010	Modified calibration tolerances Added new EPIC logo to application
0.9.7.5	9/17/2010	Corrected bug on admin page where the detail image dialog would not display.
0.9.7.6	9/17/2010	Replaced organ system text in analysis report
0.9.7.7	9/20/2010	Corrected some misspellings in the biofields
0.9.7.8	10/12/2010	Added the image alignment circle to the finger image as well as the energized images in order to help the user better discern the angle. This change will not affect the calculations or values in any way; it is strictly a visual change. Added the time to the visit date that appears on the ClearView report.
0.9.8.0	4/5/2011	Made changes to the Camera testing utility based on feedback from the Firmware engineer. Added new Gather Capture process Modified the calibration manager to be able to just regenerate the Matlab files and bypass the comparison process (Admin use only)

		Modified the view capture dialog to more efficiently do resubmissions.
		Corrected application timeout algorithm to properly function, and to display the status to the user at the bottom of the application.
		Completed a working resubmission process. Committing to Perforce in order to make continuing development safer.
0.9.9.0	5/4/2011	New calibration process
		Finger image persistence
		Quick export facility
		Some overall code reorganization (more modularity)
		Removal of old export functionality from admin pages
		Removal of image analysis dialog from admin pages
		Added connectivity indicators to the footer of the app
		Added treatment IDs to the search capture dialog
0.9.9.1	7/6/2011	Added new release files containing a colorization change for failed calibration images.
		Updated calibration routine, now uses a new more precise comparison process.
		Updated Matlab error handling.
		Corrected cache timeout issue.
		Added the ability to save both failed and successful calibration images to disk. This capability is only for administrators.
		Corrected a bug that would cause an error if a scan was viewed that had no finger images.
		Corrected a bug where the user options were missing from the main menu.

		Disabled help button per quality request.
		Massive code cleanup.
0.9.9.2	08/19/2011	Upgraded runtime from .Net 2.0 to .Net 4.0
		More code cleanup
		Added ability to save calibration log data to be used in performance assessment.
		Correction in the export calibration results routine.
		Modified the way images are handled to be more memory efficient
		Corrected a display bug in the biofield area.
		Upgraded to Crystal Reports for reporting process.
1.1.0.0	10/31/2011	Added Naive Bayes Scoring model
		Added Logistic Regression Scoring model
		Added Updated EPIC Scoring model
		Added new licensing model that supports 3 product release levels (CV and Basic).
		Updated application logging routine.
		Updated ClearView report with a completely new look.
1.1.1.0	12/9/2011	Updated scoring algorithm, modified report layouts.
		Updated licensing model code.
		Updated Matlab files and error handling process.
1.1.1.a*	12/29/2011	Modified LR scoring algorithm, to correct a minor calculation issue.
		Added ability to view calculation coefficients in

		administrative section.
		Added a new administrator type 'techadministrator'
		Relabeled 2 biofields
		Modified code to allow different sorting of reports when using different licenses.
		Added the ability to have 3 license modes rather than 2.
1.1.1.b	1/12/2012	Corrected a display issue
		Corrected stored procedure for searching by User Id
		Corrected issue on Basic report (missing value)
		Fixed a UTC timestamp issue
		Report text changes
1.1.1.c	1/13/2012	Corrected a spelling issue on a biofield
		Corrected non-conformance (3 biofields with the same score values)
1.1.1.d	1/16/2012	Modified text on report to reflect new 0-5 scoring for the Naïve Bayes calculation.
		Modified Naïve Bayes score to be a value of 0-5 rather than a value of 0-25.
1.1.1.e	1/31/2012	Corrected timestamp directory name issue in export process
		Consolidated age calculation process into a single function
		Updated SQL upgrade script
1.1.1.f	2/24/2012	Removed most demographic fields, added auditing to the ones that were left. This resulted in the following bugs being closed in the bug tracker:
		EPIC-45, EPIC-67, EPIC-68, EPIC-46, EPIC-39, EPIC-37, EPIC-73, EPIC-86, EPIC-87,
		Added device testing page in the Settings section of the

		application
		Added login tracking to prevent a user from attempting to log in unsuccessfully more than three times in a row.
		Added ability to track what version of device firmware was used to capture images.
		Fixed bug EPIC-94
1.1.1.g	2/24/2012	Added an option to display the plotted values on the NS page, this is only available to administrator and techadministrators.
		Corrected a bug where the administrator view of the 'Heart (muscle)' biofield was not displaying.
		Changed the version number in the executable from 1.1.1.f to 1.1.1.g.
		Added EPIC.Auditing source file to SCCS.
1.1.1.h	3/1/2012	Corrected EPIC-97 missing insertion date in Treatment table (for audit use).
		Corrected save issue on settings page.
		Incremented the version number to 1.1.1.h
		Corrected EPIC-96 (NS Graph Bug)

*Implemented a method for tracking changes to the software code during validation testing. The last digit in the version number (for this round, the "2" in version 1.1.1.2) is replaced with an alpha character. This alpha character is then revised for any coding changes implemented during the verification and validation test cycle.

Document Revision History

Version Number:	Description of Change:	Date:	Updated by:
000	Introduction		A. Mason