Welcome to this slides presentation of

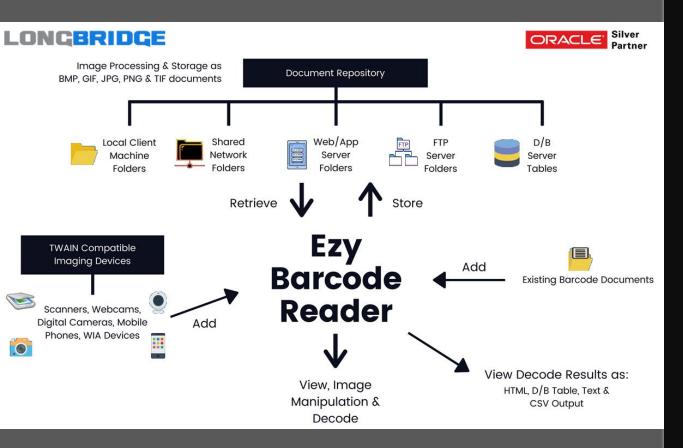
# Ezy Barcode Reader

for Oracle Forms Applications



LONGBRIDGE CONSULTING





Ezy Barcode Reader allows barcode documents to be captured from TWAIN compatible devices such as scanners, webcams, digital cameras, mobile phones, WIA devices and existing barcode documents, and loaded from supporting repositories for decoding the most of the common ID & 2D barcodes as needed.

Once documents have been captured or loaded, you can perform Image Processing functions as desired, before storing them in any one of BMP, GIF, JPG, PNG or TIF file format into document repositories such as Local Client Machine folders, Shared Network folders, Web/Application Server folders (URL locations), FTP Server folders and/or Database Server tables.

# Ezy Barcode Reader Evaluation Version

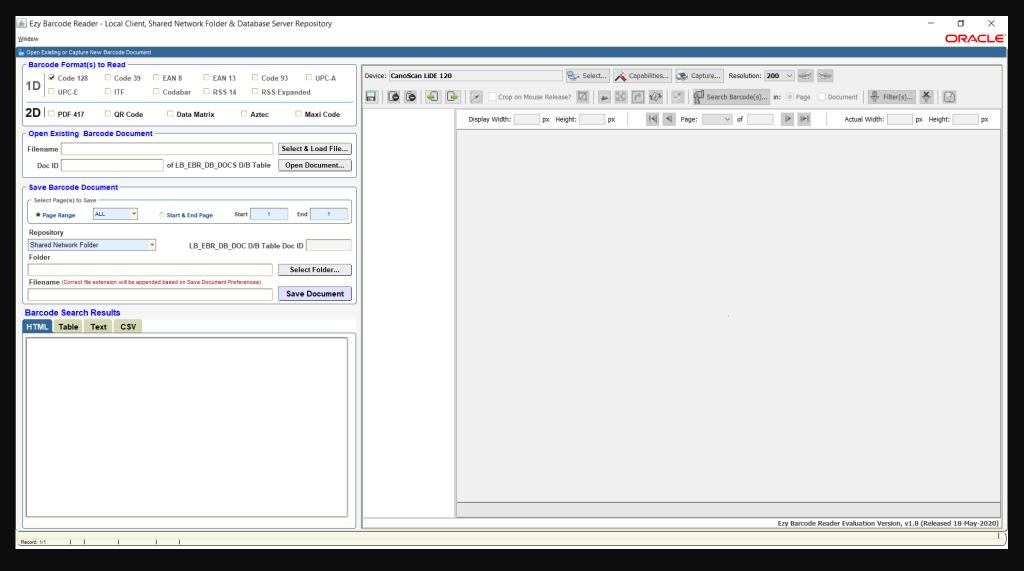
**DOWNLOAD URL LINK:** 



For the purpose of this presentation to showcase the features and functionalities of Ezy Barcode Reader, use our sample application provided within the Evaluation Version software as provided within the Download URL Link below.

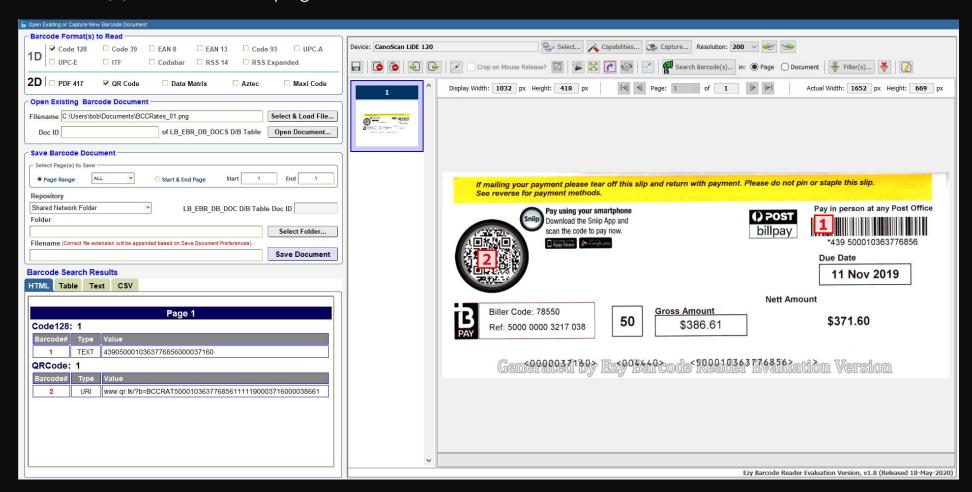
This uses the Local Client Machine folders and/or Shared Network folders, as well as the Database Server as its Document Repository.

However if you are interested in the sample application for other repositories, please do not hesitate to contact Bob Gill whose contact details are provided at the end of this presentation.

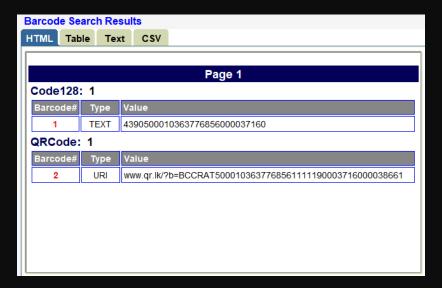


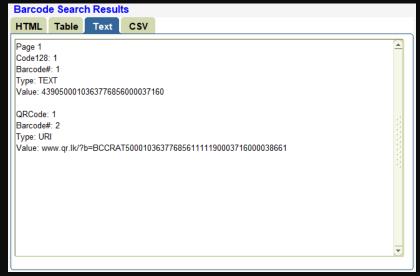
- Upon running this sample application you should see the main screen as shown above. On the upper left-hand side is a list of checkboxes representing all the supported 1D and 2D barcodes that can be searched within any captured or loaded barcode document.
- Under this is the 'Open Existing Barcode Document' region where one can load a barcode document from either the Local Client or Shared Network Folder, or from the Database Table, LB\_EBR\_DB\_DOCS, which is used within the sample application.

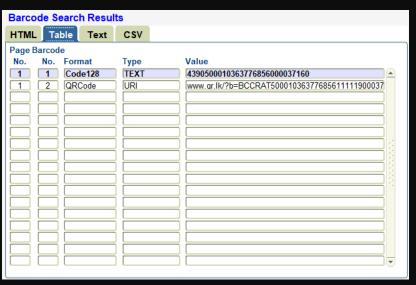
- On the right-hand side is the Java Bean User Interface (UI), which consists of a top toolbar containing Imaging Device controls to select the relevant device to capture new page(s) of barcode image(s); set the device capabilities and resolution; initiate the capture process; and add more page(s) before/after the current into an existing document within the Image Viewer from the selected imaging device.
- The bottom toolbar allows the user to set the relevant file format during the 'Save Document' process for both single and multi-pages document; delete page(s); add more page(s) before/after the current page into an existing document within the Image Viewer from existing barcode document repository from the Local Client or Shared Network Folder repository; image cropping controls; image manipulation controls; filter & undo recent filter controls; restore original image capability; search (decode) barcode(s) for the current page or entire document; and close current document control.

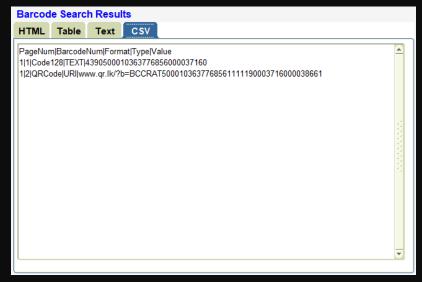


- The slide on Page 5 shows an existing barcode document being loaded from a Local Client folder, as an example, and the results of a decode process to search 'Code 128' & 'QR Code' barcodes, having been selected, and initiated by pressing 'Search Barcode(s)...' button, to generate the expected results that is displayed within 4 tab folders on the bottom left-hand side of the application screen.
- Barcode search results are displayed as HTML, Database Table, Text and CSV, as shown below, and you may use all 4 search results output or as desired according to your requirements within your own 'live' environment.

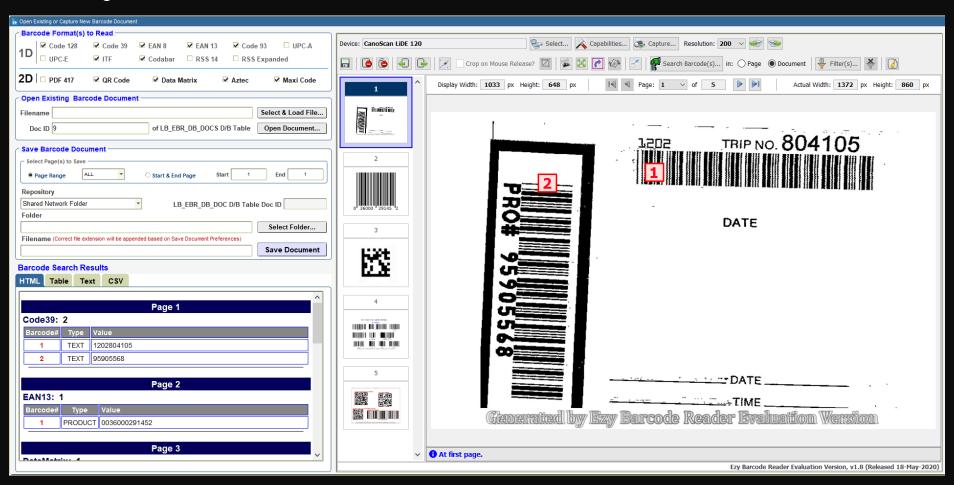




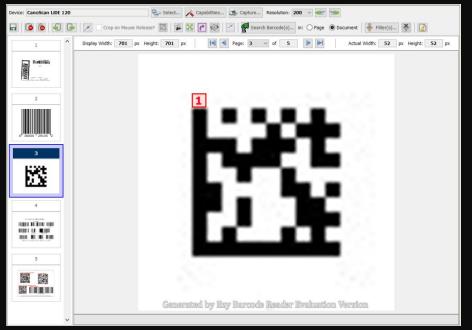


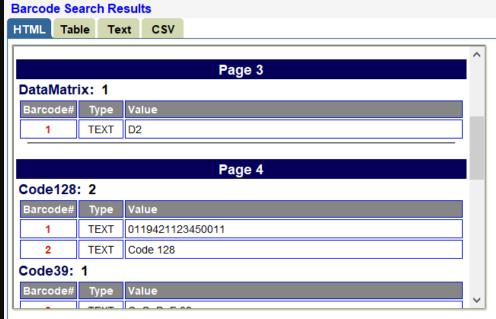


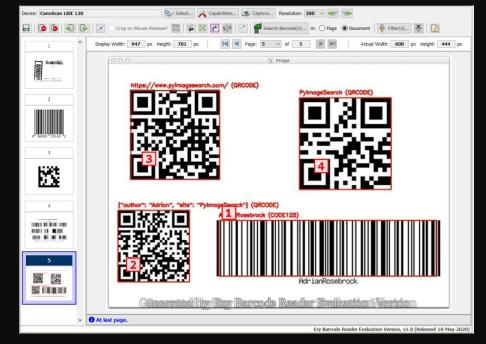
- Should you decide to perform whatever application processes after the barcode(s) decoding process, you should make use of the Database Table output, whose results are written into a session-based table called LB\_EIS\_BARCODE\_INFO.
- Should your data be encrypted, it will be presented as retrieved by the Java Barcode Decode Engine,
  after which you may perform the necessary decryption routine to carry out the necessary business
  functions for a specific database record within the above table. This flexibility allows you to
  customize the use of Ezy Barcode Reader according to your own unique business requirements.
- The next example below shows the search results of loading a multi-page TIF document from the database table, with the 'Document' option automatically selected upon loading the document into the Image Viewer.

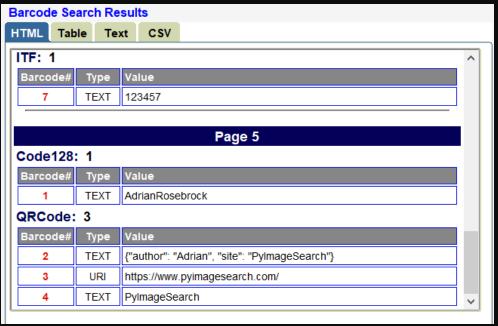


• As you navigate from 1 page to the next and so on, the relevant **HTML Page** result is automatically scrolled into view, without you having to manually use the vertical scrollbar, thus saving some valuable time in performing this. Example below shows navigation to Page 3, and then Page 5.

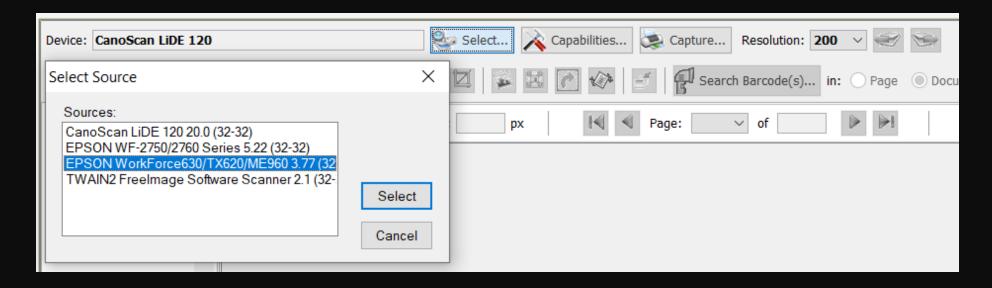




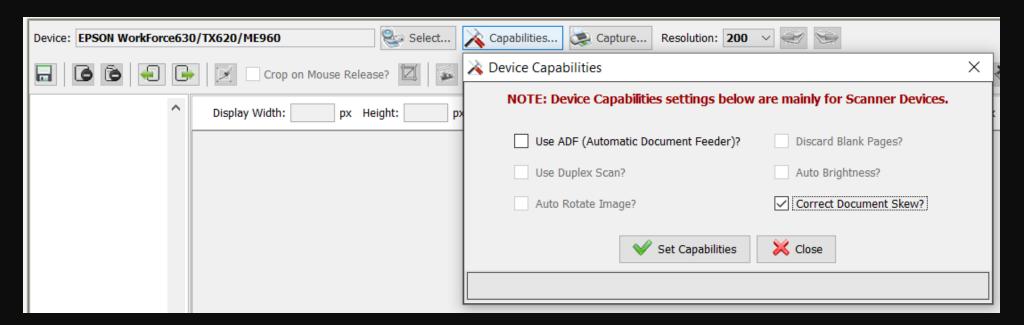




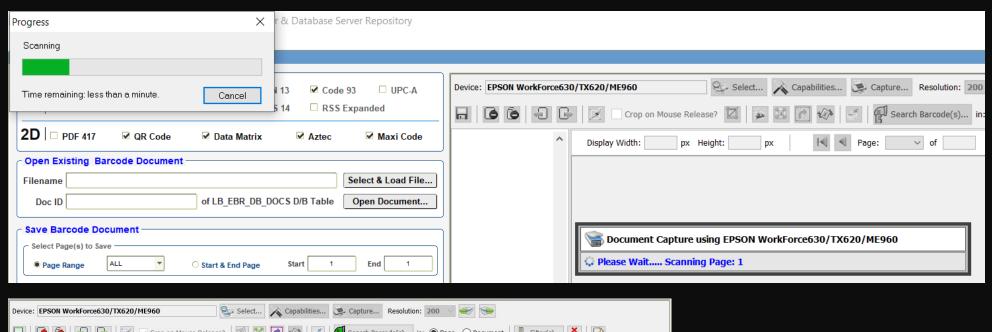
 Let's explore some of the controls within the Java UI to appreciate how easy it is to capture one or more pages from various imaging devices and perform whatever image processing functions, before we save the barcode document into the document repository.

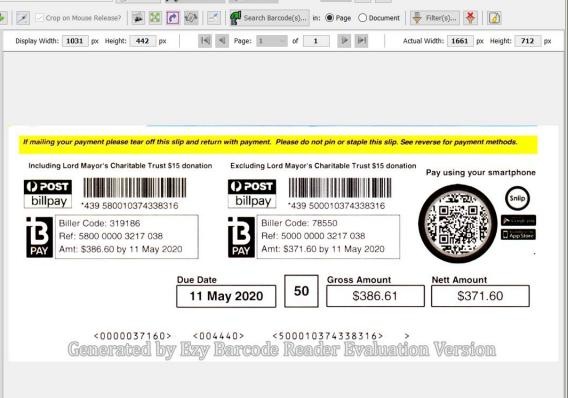


- Within the sample application, since we had programmatically set to default the last imaging device, this will be displayed within the 'Device:' field, as shown above.
- You may choose a different device by pressing 'Select...' button from the top toolbar that lists all the imaging devices that are connected either locally or remotely to your local client machine. You can then press 'Select' button on the new device to use or 'Cancel' button when the 'Select Source' popup window is displayed as shown above.
- Selecting a new device would also automatically retrieve the supported device's capabilities, which you can modify as required before performing a document capture operation.



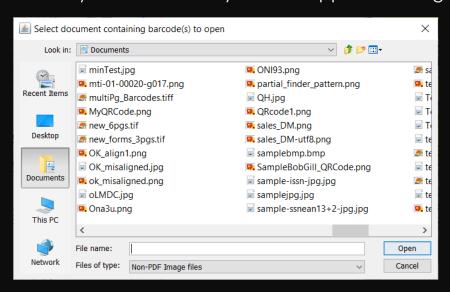
- Pressing 'Capabilities...' button will display the 'Device Capabilities' popup window as shown above. Only those capabilities supported by the imaging device will be ENABLED to allow you to set them without having to resort to using the device's own Native User Interface.
- As per my EPSON Workforce Scanner example above, ONLY 'ADF' and 'Correct Document Skew' capabilities are supported, and I have set 'Correct Document Skew' to ON by ticking its checkbox, although I am going to scan a 1 page document with a few barcodes to decode it.
- **'Resolution'** dropdown list allows you to set the image's resolution in Dots per Inch (DPI). Selections include 150, 200, 250 and 300 DPI. Usually, a minimum of 200 DPI is needed for acceptable barcode recognition, and this is auto-set by default.
- To begin the document capture process, press 'Capture...' button. Ezy Barcode Reader displays its own progress window with the name of the imaging device selected, while the device's native progress window (top left-hand side) shows the progress of the scan operation. See diagram as shown on the next slide.



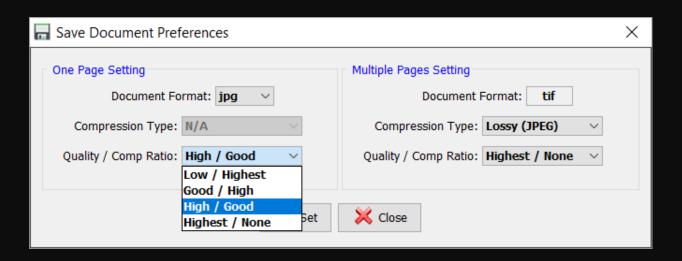


- Note that during the document capture process, all the Image Viewer's toolbar components will be disabled as shown in the slide above.
- Shown on the left is an example of a 1 page document that has been scanned, cropped and edited with a few image manipulations as required with 3 barcodes in it.

- The 2 buttons on the right within the Top Toolbar ie, 'Add Page(s) Before Current Page from Device' and 'Add Page(s) After Current Page from Device' will allow you to add additional page(s) from the imaging device anywhere within the existing document should you have forgotten any other page(s) to be captured.
- You may perform any sort of image manipulation, cropping, resizing, rotating, editing, applying relevant filter(s), addition and deletion as required before you decide to save the image page(s) into the document repository.
- Also available is the capability to add single or multiple page files from existing barcode
  documents, which can have any of these file formats, ie, 'bmp', 'gif', 'jpg', 'jpeg', 'png', 'tif' or 'tiff'.
- These 2 buttons on the bottom toolbar ie, 'Add Page(s) Before Current Page from Document and 'Add Page(s) After Current Page from Document', allows you to perform such a function, even if you do NOT have any imaging devices installed and just wish to create new barcode documents from different existing documents to store these into your document repository.
- Pressing any one of these 2 buttons will popup the 'Select document containing barcode(s) to open' Dialog Window that allows you to select any of the supported image files, as shown below:

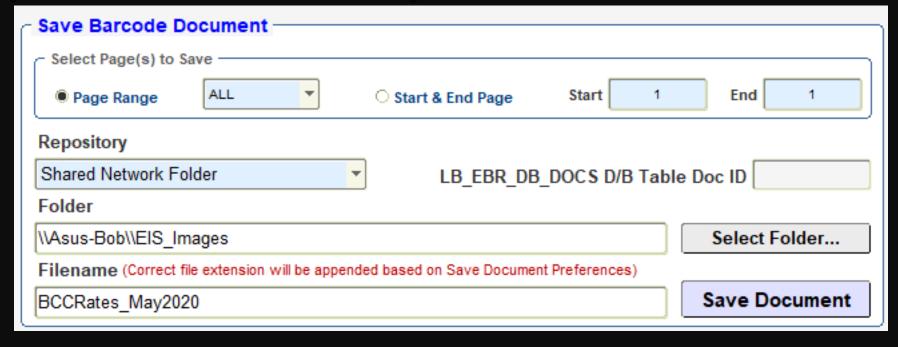


• To set your preferred image format for Single or Multiple Page(s) Barcode Document for storage purposes, you can do this through the 'Save Document Preferences...' button as shown:

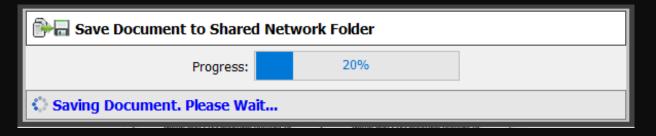


- Once you are done with the acquisition of images and necessary changes, you can save the
  document into your specific repository by entering the required values within 'Save Barcode
  Document' Forms region before pressing 'Save Document' button.
- You may select 'ALL', 'FIRST' or 'LAST' for the 'Page Range' dropdown list item or the required Start to End Page for the set of image pages captured into as many number of different documents with varying file format for single pages and different Compression Type, Quality and Compression Ratio for multiple pages TIF document.
- This makes Ezy Barcode Reader truly powerful providing a huge time saver to improve the productivity of the document capture processes within your own organization.
- To save the scanned pages into a Shared Network Folder, as an example, I have provided the following values within the 'Save Barcode Document' region, as shown on the next slide.

by pressing 'Save Document' button. You should see the Save Document Progress Window as shown below



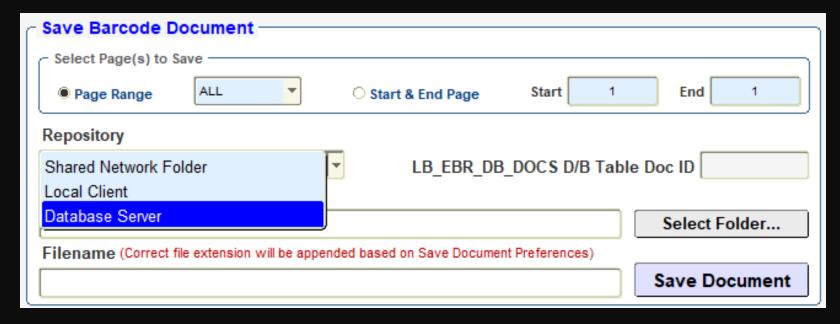
• By pressing 'Save Document' button you should see the Save Document Progress Window as shown below:



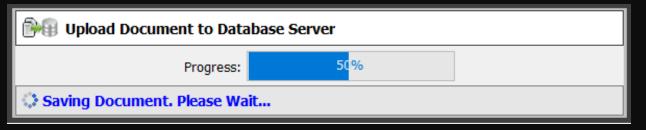
• Once the document has been saved, you will see the message on the Java Ui's Status Line as shown below:

1 Document has been saved successfully to Shared Network Folder Repository.

• To save into the Database Server, select it from the 'Repository' dropdown list as shown below:



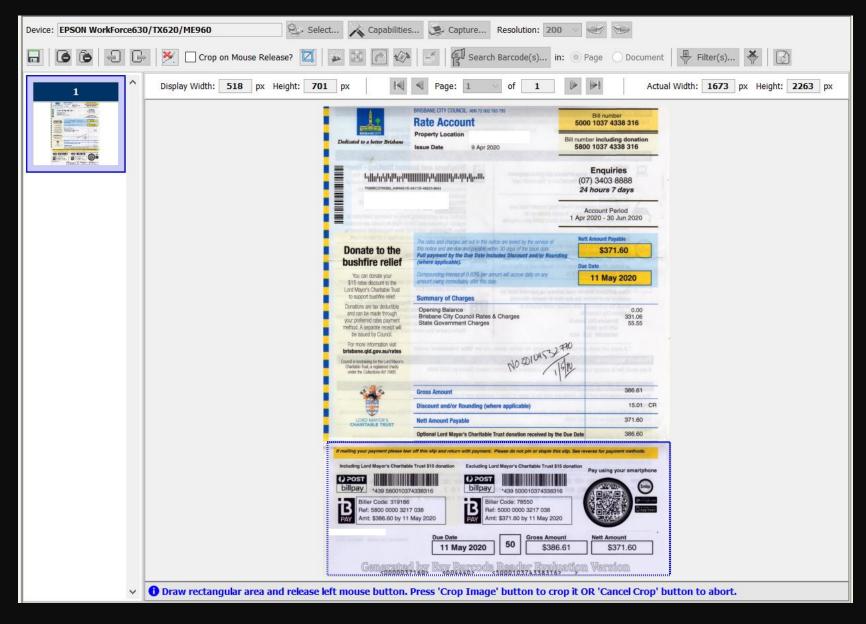
• By pressing **'Save Document'** button you should see the Save Document Progress Window as shown below:



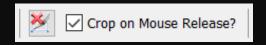
- Once the document has been saved, you will see the message on the Java Ul's Status Line as shown below, and the 'Doc ID' of 'LB\_EBR\_DB\_DOCS' will be displayed in its field:
  - 1 Document has been successfully uploaded into your Database Server Repository.



- The Image Manipulation functions are:
- The leftmost button is 'Enable Crop' button, which allows you to draw the rectangular area that you
  wish to crop, as highlighted in the blue dotted line below, and pressing 'Crop Image' button
  would then display the newly cropped image within Image Viewer, as seen on the slide on Page 11.



• The 'Crop on Mouse Release?' checkbox when checked would just hide the 'Crop Image' button, as shown below, to save you I keystroke to crop the image as per your selected rectangular area, as soon as the left mouse button is released:



- Barcode symbol contrast is a must, where Grayscale or 'Black and White' is BEST. Inaccurate
  recognition will normally be the result of a barcode which does not have the correct contrast within
  its document.
- The 'Convert to Grayscale' button, , allows you to convert a color image to grayscale, which is always preferred at times, if it is not possible to decode the document with a color image, possibly due to image quality or resolution.
- The 'Resize, Rotate & Optimize Image' button, allows you to resize the image to a larger size, if required, so that it is easier for the Barcode Decode Engine to recognize the barcode(s) within it, as a barcode's recognition largely depends on the quality and size of the barcode image.

Pressing this button displays the following popup dialog window:

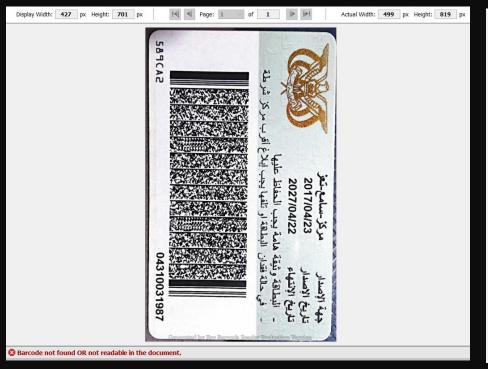
🔀 Resize, Rotate & Optimize Image	×
Resize will always honor the image's original proportions and maintain the Aspect Ratio.	
Resize By:  Percent Pixels	
Resize %: 100 V New Width: 1661 px New Height: 712 px	
Rotate: O Clockwise Anti-Clockwise Degrees (0-360.0): 0	
This feature will also apply Auto-Contrast and set the image's DPI to 200 to produce an optimised and clearer image.	
✓ OK	

- You may resize any image page by 'Percentage' (50 to 400%) or by 'Pixels', whereby changing
  any one of Width or Height, the other value is automatically calculated for you to ensure that the
  image dimension's aspect ratio is maintained to generate a well-balanced image once you have
  made the required changes.
- Should your image not be horizontally aligned, you may optionally decide to rotate the image from
  its current position in a Clockwise or Anti-Clockwise direction. Horizontal alignment is normally
  preferred for a successful decode operation of your document. This is especially true in most
  cases for PDF 417 barcode.
- Once you have made the relevant changes to either 'Resize' and/or 'Rotation', you can then press 'OK' button to perform the Image Processing operation.

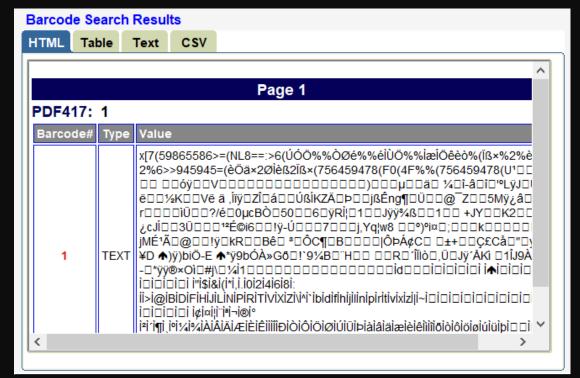
This action would also automatically generate an optimized image where 'Auto Contrast' and setting its DPI to '200' would be applied to the new image, and immediately replace the previous image within the Image Viewer.

- Image resolution is the most important factor in barcode recognition accuracy. Usually, a
  minimum of 200 DPI is needed for acceptable barcode recognition. The more dots per inch that
  make up an image, the more resolution it has. The lower the resolution, the more likely the symbol
  will lack the pixel density needed for good recognition.
- An example here demonstrates how a small image that cannot be initially read with the **PDF 417** barcode being vertically aligned. However, by rotating it anti-clockwise 90 degrees with its size being increased to 300% & adjusting the image level to whiten the background slightly, and then decoding again, successfully generates the required results.

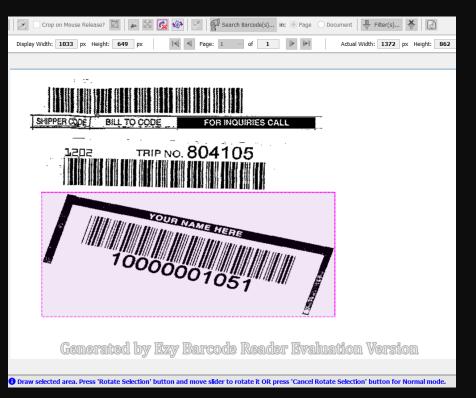
The original image, as shown in the next slide on the left-hand side, upon pressing 'Search Barcode(s)...' button, initially displays an error on its Status Line. The right-hand side image is manipulated as per stated above with the Barcode Number 1 highlighted in Image Viewer, and the HTML Page results as shown below.

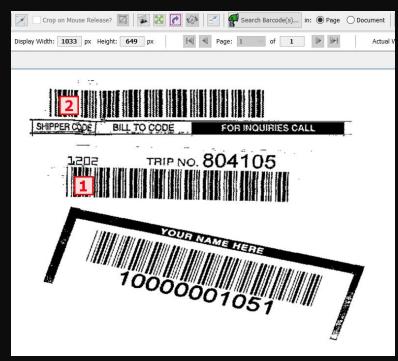


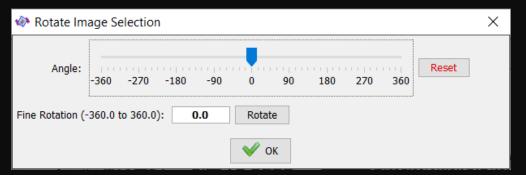




- Another useful Image Manipulation feature is 'Rotate Selection' feature. This is mainly going to be used to rotate a certain barcode within your document that may be deskewed, misaligned or placed at a certain angle that makes it difficult for the Barcode Decode Engine to easily read the barcode image.
- An example here demonstrates how the 3<sup>rd</sup> barcode, as shown on the right-hand side, cannot be initially read due to its image being deskewed or placed at a certain angle. Only 2 'Code 39' barcode images were readily detected and read by pressing 'Search Barcode(s)...' button initially.
- Let's start by pressing the 'Enable Rotate Selection' button, , to allow us to draw the rectangular area around the 'Code 128' barcode image so that we can rotate it to a horizontal position. See the screen below of how this is achieved:





• The selected area as highlighted in a purple outline needs to encompass the entire barcode image that you wish to rotate. It is not required to include any unwanted areas that actually do not represent the barcode itself. 

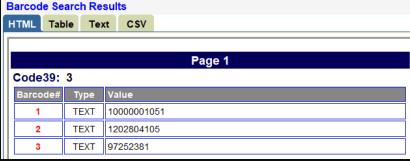
The 'Angle' Slider as shown above has a range from -360 to 360 degrees to allow you to do a full rotation, either clockwise or anti-clockwise. The 'Reset' button will set your image back to its original location and set the location of the slider knob back to 0.

As you move the slider knob leftward or rightward, the value will be automatically updated within the 'Fine Rotation' field. You can change this value and press 'Rotate' button to update the new location of the selected image.

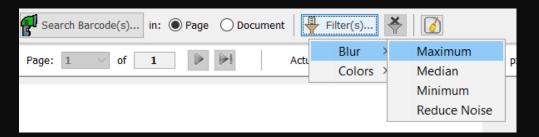
 Once you are satisfied that your new updated barcode image has been rotated to the desired location, press 'OK' button to regenerate an updated image within the Image Viewer.

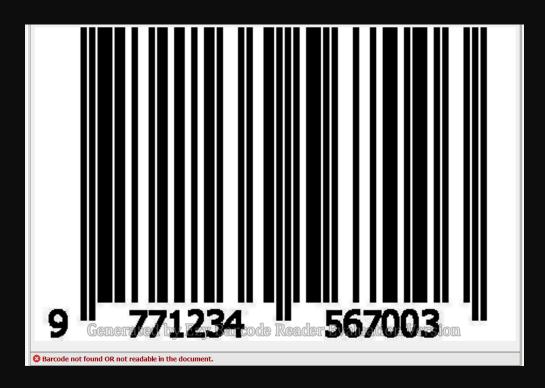
For my example, I have rotated it to '-10' and then pressed 'Search Barcode(s)...' button again to produce the following results that show that my rotation operation was successful:





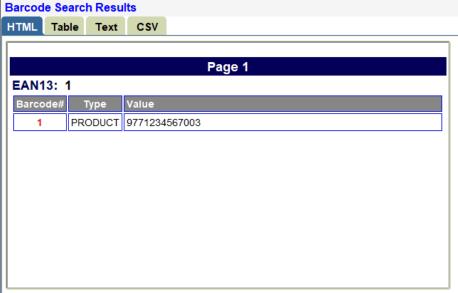
- The other Image Manipulation features that can also help to generate the correct contrast required includes 'Blur' Filters such as 'Maximum', 'Median', 'Minimum' and 'Reduce Noise'; and 'Adjust Color Filters' such as 'Contrast' and 'Levels'.
- The 'Maximum' filter, known as Dilation filter, replaces each pixel by the maximum of itself and its
  eight neighbours. This is normally used should the original pixels of your barcode be too dense or
  consists of thick bars, which results in less dense or thinner bars. The maximum filter is typically
  applied to an image to remove positive outlier noise.
- An example here demonstrates how an image that cannot be initially read with the contrast being poor, and applying the Maximum Filter, as shown below on how to do this, and then decoded again, successfully generates the required results.
- The original image, an EAN 13 barcode, as shown on the right-hand side, upon pressing 'Search Barcode(s)...' button, initially displays an error on its Status Line.





• Upon pressing 'Maximum' sub-menu item from 'Blur' menu item, as shown above, and re-running the decode operation again, generates a successful result as shown below:





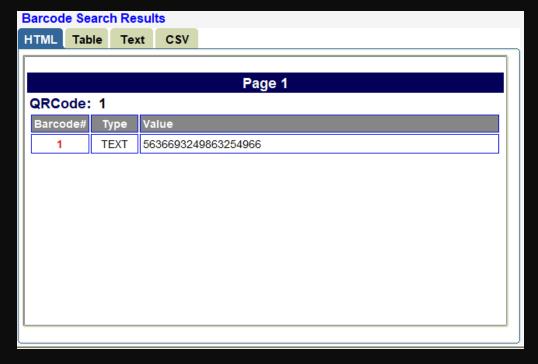
- The 'Median' filter performs a 3x3 median operation. It is useful for removing dust and noise. Should
  an image have specks of dots all over the image that interferes with the decoding operation, it is
  best that we apply the Median filter to see if the image can then be decoded successfully.
- An example here demonstrates how an image that cannot be initially read with the contrast being poor, and applying the Median Filter, and then decoded again, successfully generates the required results.

The original image, a **QR Code** barcode, as shown on the right-hand side, upon pressing 'Search Barcode(s)...' button, initially displays an error on its Status Line.

 Upon pressing 'Median' sub-menu item from 'Blur' menu item, and re-running the decode operation again, generates a successful result as shown below:



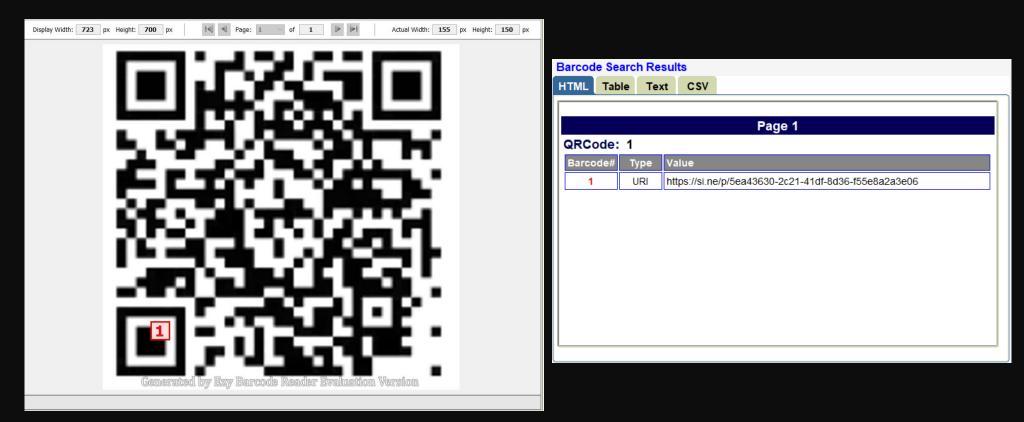




- The 'Minimum' filter, known as Erosion filter, replaces each pixel by the minimum of itself and its eight neighbours. This is normally used should the original pixels of your barcode be less dense or consists of thin bars, which results in more dense or thicker bars. The minimum filter is typically applied to an image to remove negative outlier noise.
- An example here demonstrates how an image that cannot be initially read with the contrast being poor, and applying the Minimum Filter, and then decoded again, successfully generates the required results.
- The original image, a QR Code barcode, as shown below, upon pressing 'Search Barcode(s)...'
   button, initially displays an error on its Status Line.



• Upon pressing 'Minimum' sub-menu item from 'Blur' menu item, and re-running the decode operation again, generates a successful result as shown below:

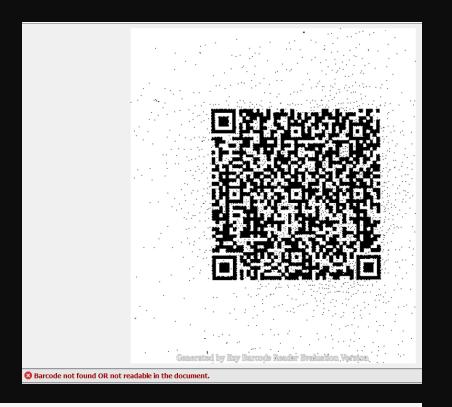


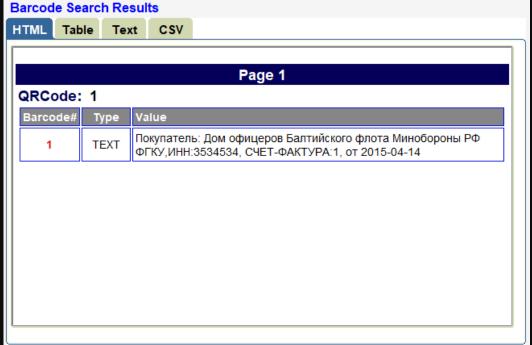
- The 'Reduce Noise' filter reduces or removes noise by looking at each pixel's 8 neighbours, and if it's a minimum or maximum, replacing it by the next minimum or maximum of the neighbours.
- An example here demonstrates how an image that cannot be initially read with the contrast being poor, and applying the Reduce Noise Filter, and then decoded again, successfully generates the required results.

The original image, a **QR Code** barcode, as shown on the right-hand side, upon pressing 'Search Barcode(s)...' button, initially displays an error on its Status Line.

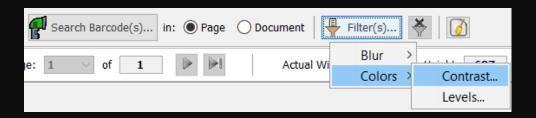
Upon pressing 'Reduce Noise' sub-menu item from 'Blur' menu item, and re-running the decode operation again, generates a successful result as shown below:

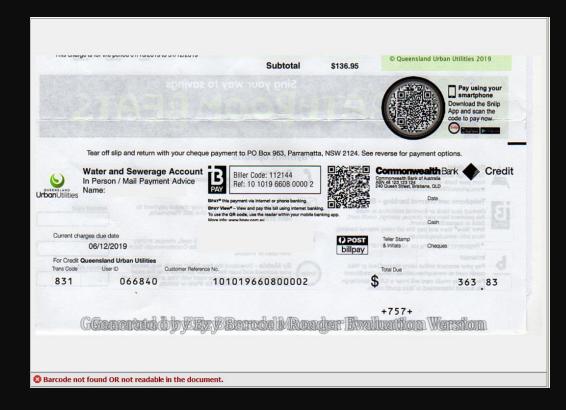






- The 'Colors / Contrast' filter allows you to adjust the Brightness and Contrast of an image should the initial decode operation fail to detect the presence of a barcode within your document.
- An example here demonstrates how an image that cannot be initially read with the contrast being poor, and applying the 'Colors / Contrast' Filter, as shown on the right-hand side on how to do this, and then decoding again, successfully generates the required results.
- The original image, containing 2 QR
   Code barcodes, as shown below, upon pressing 'Search Barcode(s)...' button, initially displays an error on its Status Line.



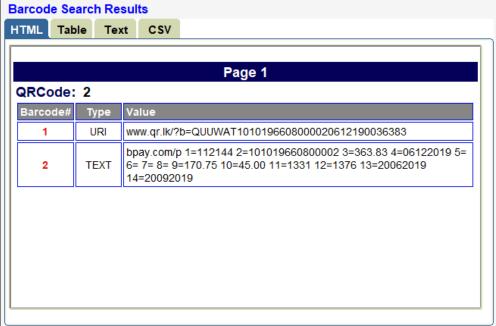


By adjusting the Brightness by moving the slider 1
mouse click towards right of 1.0, this will allow you to
increase the brightness to generate a clearer whiter
background. It is best to try in small increment of
adjusting either the Brightness and/or Contrast until
you achieve the desired results.

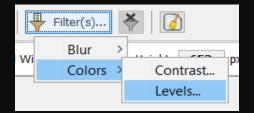


- The main objective of manipulating the image's contrast is to be able to differentiate between the light and dark elements of the symbol. Both element types are essential for proper decoding, enabling the barcode reader engine to obtain the precise patterns of barcode elements that represent encoded data in the symbol.
- The successful result as shown below:



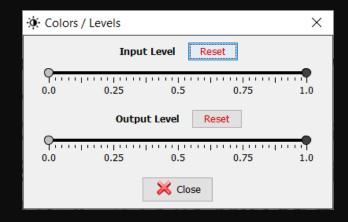


- The 'Colors / Levels' filter allows you to correct the tonal range and color balance of an image by adjusting intensity levels of image shadows, midtones, and highlights, should the initial decode operation fail to detect the presence of a barcode within your document.
- An example here demonstrates how an image that cannot be initially read with the contrast being poor, and applying the 'Colors / Levels' Filter, as shown on the right-hand side on how to do this, and then decoding again, successfully generates the required results.
- The original image, containing a Code
   128 barcode, as shown below, upon pressing 'Search Barcode(s)...' button, initially displays an error on its Status Line.



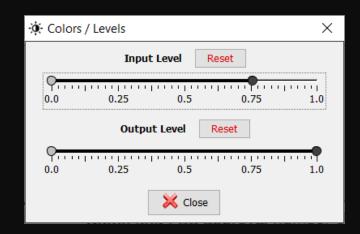


 Upon pressing 'Levels' sub-menu item from 'Colors' menu item, the following popup window, as shown on the right-hand side, will be displayed.

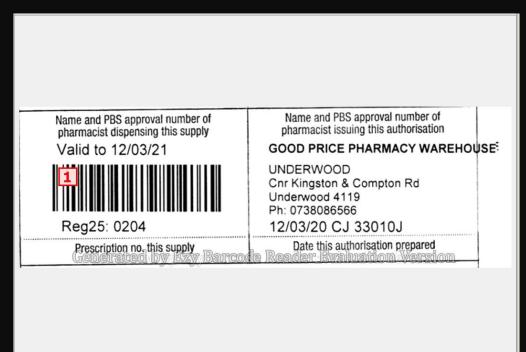


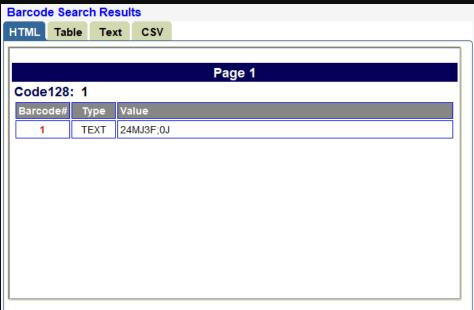
- As seen above there are 2 slider knobs for the 'Input Level' and 'Output Level'.
- The outer two Input Levels sliders map the black point and white point to the settings of the Output Level sliders.
- By default, the Output Level sliders are at level 0.0, where the pixels are black, and level 1.0, where the pixels are white. With the Output Level sliders in the default positions, moving the black input slider maps the pixel value to level 0.0 and moving the white point slider maps the pixel value to level 1.0. The remaining levels are redistributed between levels 0.0 and 1.0. This redistribution increases the tonal range of the image, in effect increasing the overall contrast of the image.
- Most of the time, you would only be adjusting the Input Level slider knobs. Moving the left slider from 0.0 towards your right, increases the black pixel value (adjusts contrast to darken the black points), and moving the right slider from 1.0 towards your left increases the white pixel value (adjusts brightness to provide a whiter background).

 Adjusting the right-hand side Input Level slider by moving the slider to 0.75, for a start, will make the background whiter. It is best to try in small increment of adjusting either the 2 Input Level slider knobs until you achieve the desired results.



- The main objective of using this filter is to adjust the brightness, contrast, and tonal range to generate a clear distinction between the black and white points of your image so that the barcode can be easily decoded.
- The successful result as shown below:





- In the event that any of your Filter operations, such as, 'Maximum', 'Median', 'Minimum', 'Reduce Noise', 'Contrast' and or 'Levels', which ALL are available by pressing the 'Filter(s)...' button, did not generate the desired result upon running the 'Search Barcode(s)' operation, you will notice that the 'Undo <xxxxx> Filter' button, 🚵, will automatically be enabled to allow you to undo the most recent Filter operation that you had performed.
  - '<xxxxx' will contain the name of the Filter that you most recently used.
- Example, if you had just used 'Levels' Filter, then this button's Tooltip would say 'Undo Levels Filter'. By pressing this 'Undo Filter' button, the previous image within the Image Viewer just prior to your 'Levels' Filter operation will automatically be updated within the viewer area. You can then try the same or another filter operation, with different values (especially for Contrast and/or Levels filter) that you believe would allow you to successfully decode the barcode image to generate the desired result.
- Should you wish to reload the original image within the current page of the loaded document at any time to restart the entire set of operations you wish to perform, you can always press the 'Restore Original Image' button,
- For different images, you will need to adjust the Brightness and/or Contrast several times using whichever of the features mentioned so far, until you generate the desired results.
- Naturally if the image is really very poor where you can visually see that it is not well created or generated, then there is no need to waste any time trying to figure out different ways of trying to generate a successful result. It is better to request for a clearer image or re-generate the barcode image correctly so that it can be readily decoded without the need to use any of the Image Manipulation features.
- To close the current document in the Image Viewer, press 'Close Document' button, 🔟



## Summary of Ezy Barcode Reader

- ❖ Very comprehensive solution for Oracle Forms applications that has no match within this marketplace where we have engineered all the "plumbing" tasks to provide the interconnection, inter-bean communication and connectivity to various repositories, imaging devices, supported barcodes & image manipulation features.
- ❖ Sample application provides knowledge and insight on how to integrate the various APIs into your own applications. Simple & easy to just copy & paste relevant sections for quick implementation within 1 to 3 days ONLY.
- ❖ Sample application is a huge time saver compared against other competitors, mainly offering SDKs, where lots of time will be spent on developing routines to design Java UI; figure out which APIs to use; test for success, error & exceptions; and lots of other tasks typical of any software development project, which can take 6 to 12 months of effort.

## Summary of Ezy Barcode Reader

- ❖ Java UI can be programmatically customized to easily suit your needs and front-end can just call the relevant APIs instead of providing any Forms UI for specifying the API values. User Guide, Technical Guide, Document Capture Error Processing Guide & Technical Support from us will provide you with much valuable information for a successful implementation in no time.
- ❖ We are happy to enhance and customize Ezy Barcode Reader to fit in with your unique & specific needs & requirements. Feel free to contact Bob Gill, whose email is provided at the end of this presentation.
- ❖ Not only do we provide a Java Bean version for Oracle Forms applications, but also have a Java Applet and Java Web Start version for other web-based technologies such as Oracle Apex, ADF, JSP, OAF, .Net, ASP, PHP, Python, Ruby, Formspider, etc, thereby providing a uniform & consistent Look & Feel and rich User Experience across your organization's various application development platforms.

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