RasterEdge.XDoc.DICOM for .NET SDK

Developer's Guide

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Getting Started

System Requirements for .NET

Supported Operating System

The following Microsoft Windows operating systems are supported:

- Microsoft Windows XP Home Edition
- Microsoft Windows XP Professional Edition
- Microsoft Windows XP Professional x64 Edition
- Microsoft Windows 2003 Server
- Microsoft Windows 2008 Server R2
- Microsoft Windows Vista
- Microsoft Windows Vista x64 Edition
- Microsoft Windows 7
- Microsoft Windows 7 Enterprise x64 Edition
- Microsoft Windows 7 Professional x64 Edition
- Microsoft Windows 2012 Server x64 Edition

Development Environments

You can use RasterEdge.XDoc.DICOM for .NET to develop applications in any development environment that targets the .NET platform, but the following environments are explicitly supported:

- Microsoft Visual Studio 2005
- Microsoft Visual Studio 2008
- Microsoft Visual Studio 2010
- Microsoft Visual Studio 2011
- Microsoft Visual Studio 2012
- Microsoft Visual Studio 2013
- Microsoft Visual Studio 2015

.NET Framework versions supported

The following .NET Framework versions are supported:

- .NET Framework 2.0
- .NET Framework 3.0
- .NET Framework 3.5

.NET Framework 4.0
.NET Framework 4.5
.NET Framework 4.5.1
.NET Framework 4.5.2
.NET Framework 4.6

Reference RasterEdge.XDoc.DICOM in .NET project

Necessary Libraries

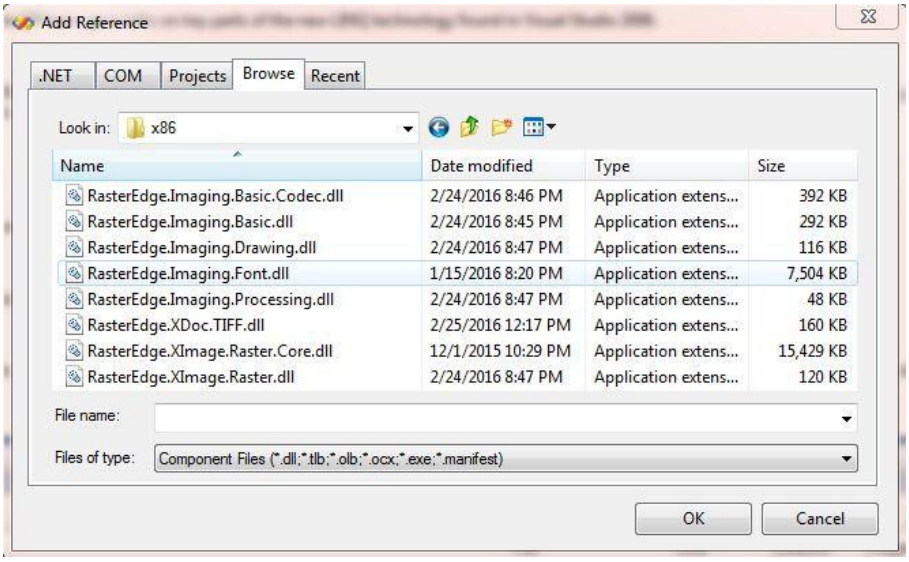
To use RasterEdge.XDoc.DICOM library successfully, the following libraries are necessary:

RasterEdge.Imaging.Basic.dll
RasterEdge.Imaging.Basic.Codec.dll
RasterEdge.Imaging.JPEG2000.dll
RasterEdge.Imaging.Processing.dll
RasterEdge.XImage.Raster.Core.dll
RasterEdge.XImage.Raster.dll
RasterEdge.XDoc.DICOM.dll

Add References

The following steps will show you how to use in Visual Studio.NET:

1. In the Solution Explorer, expand the project node you want to add a reference to.
2. Right-click the project's **References** node and select **Add Reference**.
3. In the Add Reference dialog box, Click **Browse** and Navigate to the specified folder.
4. Select the dlls as listed in the following screenshot, Click **OK**.



5. The RasterEdge.XDoc.DICOM for .NET reference appears under the project's **References** node.

If you want to know how to select dlls according to your specific development environment, please refer to the **Readme.txt** file in the **/Bin** directory.

FAQ

Errors On Visual Studio

If you get the error as follows:
"Could not load file or assembly 'RasterEdge.XDoc.DICOM'or one of its dependencies. An attempt was made to load a program with an incorrect format."
Please check your project configures as following ways:
1. If you are using the .NET Framework 4.0 dlls, please confirm that:

Right-click the project -> Properties ->
a. Application -> Target framework: .NET Framework 4 or higher
b. Build -> Platform target: x86 if using x86 dlls, x64 if using x64.
2. If you are using the .NET Framework 2.0 dlls, please confirm that:

Right-click the project -> Properties ->
c. Application -> Target framework: .NET Framework 3.0 or 3.5
d. Build -> Platform target: x86 if using x86 dlls, x64 if using x64.

Errors On IIS

If you configure IIS to run and 500.19 error occurs, then it may be caused by:
1. Not registered the .net framework to the iis. (One of reasons: install a .net framework before the installation of iis.)
2. The site configured in IIS has no sufficient authority to operate. (Modify permission)

There are some solutions:
1. cd to C:\Windows\Microsoft.NET\Framework64\v2.0.50727,Command to re-register net framework to the iis:aspnet_regiis-i.
2. Right-click the correspond site-> Edit Permissions -> Security -> Group or user names-> Edit -> Add -> Add Everyone usersgiven Full Control permissions.

If you get the error as follows:
"Could not load file or assembly "RasterEdge.Imaging.Basic" or any other one assembly or one of its dependencies. An attempt was made to load a program with an incorrect format."
Please check your IIS configure as following ways:
a. If you are using the .NET framework 4.0 or higher dlls, confirm that Web.config is using the content in ***Web(for .net4.0 or higher).Config file***.
b. After checking first step, if you are still facing the issue, confirm that:

If you are using x64 dlls, "Application Pools" -> "Set Application Pool Defaults… "->" Enable 32-Bit

Applications" should be false.
If you are using x86 dlls, “Application Pools” -> "Set Application Pool Defaults…" -> "Enable 32-Bit Applications" should be true.

Feature List

DICOM Generator

- Create DICOM from byte array
- Create DICOM from file path
- Create DICOM from stream
- Create DICOM from bitmaps

DICOM Document

- Get DICOM Document properties
- Get a particular DICOM page
- Convert To Images
- Convert To Document
- Extract DICOM pages

DICOM Page

- Get DICOM page properties
- Convert To Image

Annotations

- Add Annotation
- Add Image Annotation

Save

- Save DICOM to file path
- Save DICOM to byte array
- Save DICOM to stream

Programmer Guide

DICOM Object Generator

Our RasterEdge.XDoc.DICOM dll allows developer to create TIFF file from Bitmap and Dicom file.

Create DICOM Document object from file path/data

You can easily create a dicom document object just follow the code below:

C#:

```
//load a dicom file object from input file path
String inputPath = @"F:\input.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
```

Related API(s) (**DCMDocument.cs**):

public DCMDocument(string filePath);

Descriptions:

Create a dicome document object from file path.

Parameters:

Name	Description	Valid Value
filePath	the dicom file's path	there must be a valid dicomfile at this location

public DCMDocument(byte[] fileData);

Descriptions:

Create a dicom document object from byte array

Parameters:

Name	Description	Valid Value
fileData	a byte array contains the whole dicom file data	must be valid

public DCMDocument(Stream stream);

Descriptions:

Create a dicom document object froma stream.

Parameters:

Name	Description	Valid Value
stream	the stream must contains a whole dicom file data	must be valid

Create DICOM Document object from images.

It allows developers create dicom document object from a single bitmap or a bitmap array with optional informations.

Create Dicom document object without options.

```
C#:
//create a dicom file object from bitmap
Bitmap bmp = new Bitmap(@"F:\sample.jpg");
DCMDocument dcmDoc = new DCMDocument(bmp);
dcmDoc.Save(@"F:\output.dcm");
```

Related API(s) (**DCMDocument.cs**):

public DCMDocument(Bitmap bmp);

Description:

Create a dicom document object from bitmap with no format limited, that is, the bitmap can be a .jpeg image or a .png image or some else single frame image.

Parameters:

Name	Description	Valid Value
bmp	the image for creating dicom document object	must be valid

public DCMDocument(Bitmap[] bmps);

Descriptions:

Create a dicome document object from a bitmap array. These images must has the same size and color space.

Parameters:

Name	Description	Valid Value
bmps	a series of bitmaps for creating dicom document object	every image must be a valid one

Create Dicom document object with specified information.

It allows create dicom document object from a single bitmap or a bitmap array with specified information, therefore, the patient name, patient id, study date can be defined by yourself.

C#:

```
//create a dicom file object from bitmap with specified information
Bitmap bmp = new Bitmap(@"F:\sample.jpg");
Infomation infos = new Infomation();
infos.PatientName = "SpongeBob"
infos.PatientSex = "male";
//format: YYYYMMDD      YYYY:year/MM:month/DD:day
infos.StudyDate = "20160729";
//format:HHMMSS      HH:hour/MM:minutes/SS:second
infos.StudyTime = "153120";
DCMDocument dcmDoc = new DCMDocument(bmp,infos);
dcmDoc.Save(@"F:\output.dcm");
```

Related API(s) (**DCMDocument.cs**):

public DCMDocument(Bitmap bmp, Infomation info);

Description:

Create dicom document object from bitmap with specified information.

Parameters:

Name	Description	Valid Value
bmp	image for dicom document object creating	must be a valid image
info	a description for the dicom file.	-

public DCMDocument(Bitmap[] bmps, Infomation info);

Descriptions:

Create dicom document object from a bitmap array with specified information.

Parameters:

Name	Description	Valid Value
bmps	images for dicom document object creating	every image must be valid
info	a description for the dicom file	-

Working with Document

Get Page Count

The following demo code will show you how to get the total page number of dicom file.

C#:

```
String inputPath = @"F:\input.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
int pageCount = dcmDoc.GetPageCount();
```

Related API(s) (**DCMDocument.cs**):

public override int GetPageCount();

Return: 0 if falied.

Get Document Type

You can do follow to get the input document's type:

C#:

```
String inputPath = @"F:\input.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
DocumentType type = dcmDoc.GetDocumentType();
```

Related API(s) (**DCMDocument.cs**):

public override DocumentType GetDocumentType();

Description:

Get the document type of the input file.

Return:

DICOM, Invalid or other format if failed

Extract DICOM Page(s) to DICOM file/stream

To extract DICOM page(s) to a file or stream, the following steps will be helpful:

1. Open an existing DICOM file.
2. Define the page indexes will be extracted.
3. Call the method ExtractPages to save the specified pages as a new dicome file.

C#:

```
String inputPath = @"F:\input.dcm";
String outputPath = @"F:\output.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
int[] pageIndex = new int[3] { 0, 1, 4 };
dcmDoc.ExtractPages(pageIndex, outputPath);
```

Related API(s) (**DCMDocument.cs**):

```
public override void ExtractPages(int[] extractIds, string filePath);
```

Descriptions:

Extract the specifed pages and save them as a new dicom file. The compression type of the image in the new file is lossy jpeg.

Parameters:

Name	Description	Valid Value
extractIds	page index	0 to page count - 1
filePath	output file path	valid file path

```
public override void ExtractPages(int[] extractIds, Stream stream);
```

Description:

Extract the specified pages and save them as a new dicom file into the stream.

Parameters:

Name	Description	Valid Value
extractIds	page index	0 to page count – 1
stream	output stream	valid file stream or memory stream

Get a Particular Page

Follow the code below to get a specified page from the dicom file.

C#:

```
String inputPath = @"F:\input.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
DCMPage page = (DCMPage)dcmDoc.GetPage(0);
```

Related API(s) (**DCMDocument.cs**):

```
public override BasePage GetPage(int pageIdx);
```

Descriptions:

Get a specified page from the dicom document object.

Parameters:

Name	Description	Valid Value
pageIdx	the page index	0 to page count - 1

Convert to Images

This section will tell you how to convert the whole dicom file to images. it's quite easy just get a dicom document object and call the method ***ConvertToImages***. The following demo code will show you how to complete the conversion.

```
C#
//open a Dicom file
String inputPath = @"F:\7Frames.dcm";
//set the output directory;
String outputDir = @"F:\Dcm2jpeg\";
DCMDocument dcmDoc = new DCMDocument(inputPath);
//convert all frames to jpeg images
//it will create jpeg images in the directory whose name is "demo_"
//note:you must create the output folder on your disk.
dcmDoc.ConvertToImages(ImageType.JPEG, outputDir, "demo_");
```

Related API(s) (**DCMDocument.cs**):

public override void ConvertToImages(ImageType targetType, string directory, string fileName);

Descriptions:

Convert all frames of dicom file to image with specified format and save them to the given folder.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
directory	output directory	must exist
fileName	output image's name without suffix	a string

public override void ConvertToImages(ImageType targetType, Stream[] streams);

Descriptions:

Convert all frames of dicom file to image with specified format and save them to memory stream or file stream.

Parameters:

Name	Description	Valid Value
targetType	format of the output image	-
streams	output stream	-

public override void ConvertToImages(ImageType targetType, float zoomValue, Stream[] streams);

Descriptions:

Convert all frames of dicom file to target format images with specified zoom value and save them to memory stream or file stream.

Parameters:

Name	Description	Valid Value
targetType	format of the output image	-
zoomValue	the magnifacation of the output image	>0
streams	output stream	-

public override void ConvertToImages(ImageType targetType, int resolution, Stream[] streams);

Descriptions:

Convert all frames of dicom file to the target format images with specified resolution and save them to memory stream or file stream.

Parameters:

Name	Description	Valid Value
targetType	format of the output image	-
resolution	the resolution of output image	>0
streams	output stream	

public override void ConvertToImages(ImageType targetType, float zoomValue, string directory, string fileName);

Descriptions:

Convert all frames of dicom file to the target format images with specified zoom value and save them to the given folder.

Parameters:

Name	Description	Valid Value
targetType	format of the output image	-
zoomValue	the magnifacation of the output image	>0
directory	output directory	must exist
fileName	output image's name without suffix	a string

public override void ConvertToImages(ImageType targetType, int resolution, string directory, string fileName);

Descriptions:

Convert all frames of dicom file to the target format images with specified resolution and save them to the given folder.

Parameters:

Name	Description	Valid Value
targetType	format of the output image	-
resolution	resolution of the output image	>0
directory	output directory	must exist
fileName	output image's name without suffix	a string

Convert To Document

Add extra references:

If you want to Convert DICOM document to PDF(TIFF) document, you need add following dll:

RasterEdge.XDoc.PDF(TIFF).dll

To achieve the conversion, please do as follows:

1: Open an existing DICOM file.

2: Call the method **ConvertToDocument** to complete the conversion.

The following demo code will show you how to convert DICOM file to TIFF file:

```
C#
//open a DICOM file
String inputPath = @"F:\input.dcm";
String outputPath = @"F:\output.tif";
DCMDocument dcmDoc = new DCMDocument(inputPath);
//convert DICOM file to TIFF file.
dcmDoc.ConvertToDocument(DocumentType.TIFF, outputPath);
```

Related API(s) (**DCMDocument.cs**):

public override void ConvertToDocument(DocumentType targetType, Stream stream);

Descriptions:

Convert dicom file to tiff document or pdf document and save it to stream.

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
stream	output stream	valid memory stream or file stream

public override void ConvertToDocument(DocumentType targetType, string filePath);

Descriptions:

Convert dicom file to tiff document or pdf document and save it to the given path.

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
filePath	output file path	a string

public override void ConvertToDocument(DocumentType targetType, float zoomValue, Stream desStream);

Descriptions:

Convert dicom file to tiff document or pdf document with specified magnification and save it to stream.

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
zoomValue	magnification of output file	>0
desStream	output stream	memory stream or file stream

public override void ConvertToDocument(DocumentType targetType, float zoomValue, string filePath);

Descriptions:

Convert dicom file to tiff document or pdf document with specified magnification and save it to the given path.

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
zoomValue	magnification of output file	>0
filePath	output file path	-

public override void ConvertToDocument(DocumentType targetType, int resolution, Stream desStream);

Descriptions:

Convert dicom file to tiff document or pdf document with specified resolution and save it to stream

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
resolution	resolution of output file	>0
desStream	output stream	a valid memory stream or file stream

public override void ConvertToDocument(DocumentType targetType, int resolution, string filePath);

Descriptions:

Convert dicom file to tiff document or pdf document with specified resolution and save it to the given path.

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
resolution	resolution of output file	>0
filePath	output file path	-

public override void ConvertToDocument(DocumentType targetType, Stream desStream, ImageOutputOption options);

Descriptions:

Convert dicom file to tiff document or pdf document with optional settings and save it to stream

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
desStream	output stream	a valid memory stream or file stream
options	settings for output file	-

```
public override void ConvertToDocument(DocumentType targetType, string filePath,
ImageOutputOption options);
```

Descriptions:

Convert dicom file to tiff document or pdf document with optional settings and save it to the given path.

Parameters:

Name	Description	Valid Value
targetType	format of output file	-
filePath	output file path	-
options	settings for output file	-

Working with Page

Get Frame Width/Height

```
C#
//load DICOM file Document object from file path
String inputPath = @"F:\input.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
//get the first frame
DCMPage page = (DCMPage)(dcmDoc.GetPage(0));
//the width of the frame
int width = (int)page.GetWidth();
int height = (int)page.GetHeight();
```

Related API(s) (**DCMPage.cs**):

public override float GetHeight();

Descriptions:

Get the height of the frame.

Return:

0 if failed

public override float GetWidth();

Description:

Get the width of the frame

Return:

0 if failed

Convert to Image

To convert the specified frame of DICOM file to image, you just need several steps as follows:

1: Open an existing DICOM file through DICOM document object.

2: Call Method GetPage to get a frame of DICOM file.

3: Call method ConvertToImage to convert the frame to image and save it to file path, byte array or stream.

The following demo code will show the conversion in details:

```
C#
//open a DICOM file
String inputFilePath = @"F:\7Frames.dcm";
String outputFilePath = @"F:\output.png";
DCMDocument dcmDoc = new DCMDocument(inputFilePath);
//get the first frame of the file.
int pageIndex = 0;
DCMPage page = (DCMPage)dcmDoc.GetPage(pageIndex);
//convert Dicome frame to image
Bitmap bmp = page.ConvertToImage();
//save the bitmap to file path.
bmp.Save(outputFilePath);
```

Related API(s) (**DCMPage.cs**):

public override Bitmap ConvertToImage();

Descriptions:

Convert the specified frame of dicom file to image.

Return:

Null if failed.

public override Bitmap ConvertToImage(float zoomValue);

Descriptions:

Convert a frame of dicom file to image with specified magnification.

Parameters:

Name	Description	Valid Value
zoomValue	the magnification of output image	>0

Return:

Null if failed.

public override Bitmap ConvertToImage(int targetResolution);

Descriptions:

Convert a frame of dicom file to image with specified resolution.

Parameters:

Name	Description	Valid Value
targetResolution	resolution of output image	>0

Return: Null if failed.

public override Bitmap ConvertToImage(Size targetSize);

Descriptions:

Convert a frame of dicom file to image and scale it to the target size.

Parameters:

Name	Description	Valid Value
targetSize	the size of output image	width>0 && height>0

Return:

Null if failed.

public override void ConvertToImage(ImageType targetType, string filePath);

Descriptions:

Convert a frame of dicom file to image with specified format and save it to the given path.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
filePath	output path	-

public override void ConvertToImage(ImageType targetType, float zoomValue, string filePath);

Descriptions:

Convert a frame of dicom file to image with specified format, and save it to the given path with target magnification.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
zoomValue	magnification of output image	>0
filePath	output path	-

public override void ConvertToImage(ImageType targetType, int resolution, string filePath);

Descriptions:

Convert a frame of dicom file to image with specified format and save it to the given path with target resolution.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
resolution	resolution of output image	>0
filePath	output file path	-

public override byte[] ConvertToImageBytes(ImageType targetType);

Descriptions:

Convert a frame of dicom file to image with specified format and return it as a byte array.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-

Return:
Null if failed.

public override byte[] ConvertToImageBytes(ImageType targetType, float zoomValue);
Descriptions:
Convert a frame of dicom file to image with specified format and magnification, then return it as a byte array.
Parameters:

Name	Description	Valid Value
targetType	format of output image	-
zoomValue	magnification of output image	>0

public override byte[] ConvertToImageBytes(ImageType targetType, int targetResolution);
Descriptions:
Convert a frame of dicom file to image with specified format and resolution, then return it as a byte array.
Parameters:

Name	Description	Valid Value
targetType	format of output image	-
targetResolution	resolution of output image	>0

public override Bitmap ConvertToImageFitHeight(int height);
Descriptions:
Convet a frame of dicom file to image with specified height.
Parameters:

Name	Description	Valid Value
height	height of output image	>0

Return:
Null if failed.

public override Bitmap ConvertToImageFitWidth(int width);
Descriptions:
Convet a frame of dicom file to image with specified width.
Parameters:

Name	Description	Valid Value
width	width of output image	>0

Return:
Null if failed.

public override void ConvertToImageStream(ImageType targetType, Stream stream);
Descriptions:
Convert a frame of dicom file with specified format and save it to a memory stream or a file stream.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
stream	output stream	a valid stream

public override void ConvertToImageStream(ImageType targetType, float zoomValue, Stream stream);

Descriptions:

Convert a frame of dicom file with specified format and mangnification and save it to a memory stream or a file stream.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
zoomValue	mangnification of output image	>0
stream	output stream	a valid stream

public override void ConvertToImageStream(ImageType targetType, int resolution, Stream stream);

Descriptions:

Convert a frame of dicom file with specified format and resoluiton and save it to a memory stream or a file stream.

Parameters:

Name	Description	Valid Value
targetType	format of output image	-
resolution	resolution of output image	>0
stream	output stream	a valid stream

public override Bitmap CropImage(Rectangle sourceRegion, Size targetSize);

Descriptions:

Take a sub region out from the frame and scale it to target size.

Parameters:

Name	Description	Valid Value
sourceRegion	take this sub region out	a valid rectangle
targetSize	target size of the sub region	a valid Size

Return:

Null if failed.

public override Bitmap GetBitmap();

Descriptions:

Convert a frame of dicom file to bitmap.

Return:

Null if failed.

public override Bitmap GetBitmap(float zoomValue);

Descriptions:

Convert a frame of dicom file to bitmap with specified magnification.

Parameters:

Name	Description	Valid Value
zoomValue	magnification of output file	>0

Return:

Null if failed.

public override Bitmap GetBitmap(int resolution);

Descriptions:

Convert a frame of dicom file to bitmap with specified resolution.

Parameters:

Name	Description	Valid Value
resolution	resolution of output file	>0

Return:

Null if failed.

public override Bitmap GetBitmap(Rectangle sourceRectangle, Size targetSize);

Descriptions:

Take a specified sub region out from the frame and scale it to target size.

Parameters:

Name	Description	Valid Value
sourceRectangle	take this sub region out	a valid rectangle
targetSize	target size of the sub region	a valid Size

Return:

Null if failed.

Working with Annotation

Add annotation

In order to add annotation to dicom files, you need to add extra reference:

- RasterEdge.Imaging.Annotation.dll

Three steps to add an annotation on the frame:

1: Add RasterEdge.Imaging.Annotation dll to your reference.

2: Create a annotation through AnnotationGenerator

3: Add the annotation on the frame.

There are 9 types annotation, and you can create them by calling the method below:

Type	Method
Line	AnnotationGenerator.CreateLineAnnotation()
Lines	AnnotationGenerator.CreateLinesAnnotation()
Image	AnnotationGenerator.CreateEmbeddedImageAnnotation()
FreeHand	AnnotationGenerator.CreateFreeHandLineAnnotation()
Ellipse	AnnotationGenerator.CreateEllipseAnnotation()
Rectangle	AnnotationGenerator.CreateRectangleAnnotation()
Polygon	AnnotationGenerator.CreatePolygonAnnotation()
Text	AnnotationGenerator.CreateTextAnnotation()
RubberStamp	AnnotationGenerator.CreateRubberStampAnnotation()

Table 1-1

The following demo code will show you how to add a text annotation to dicom file:

```
C#
//open a DICOM file
DCMDocument dcmDoc = new DCMDocument(@"F:\input.dcm");
DCMPage page = (DCMPage)dcmDoc.GetPage(0);
//create a text annotation
TextAnnotation annotation = AnnotationGenerator.CreateTextAnnotation(10, 100F, 200F,
100F, "www.RasterEdge.com", new System.Drawing.Font("Arial", 12F));
//add it on the frame
page.AddAnnotation(annotation);
dcmDoc.Save(@"F:\output.dcm");
```

Related API(s) (**DCMPage.cs**):

```
public override void AddAnnotation(AnnotationHandler annoHandler);
```

Descriptions:

Add annotation on the frame.

Parameters:

Name	Description	Valid Value
annoHandler	An annotation object	Created by the Method in the **Table 1-1**

```
public void AddAnnotation(AnnotationHandler annoHandler, float zoomValue);
```

Descriptions:

Add annotation on the frame with specified magnification.

Parameters:

Name	**Description**	**Valid Value**
annoHandler	An annotation object	Created by the Method in the **Table 1-1**
zoomValue	magnification of annotation	>0

Add Image Annotation

The following demo code will show you how to add an image annotation to dicom file:

```
C#
//open a DICOM file
DCMDocument dcmDoc = new DCMDocument(@"F:\input.dcm");
//get specified DICOM page
DCMPage page = (DCMPage)dcmDoc.GetPage(0);
//load an image
BaseImage image = new REImage(@"F:\logo.png");
//set the image annotation location
PointF position = new PointF(200f, 200f);
//add image annotation on the frame at specified location.
page.AddImage(image, position);
dcmDoc.Save(@"F:\output.dcm");
```

Related API(s) (**DCMPage.cs**):

```
public override void AddImage(BaseImage image, PointF point);
```

Descriptions:

Add image on frame at the specified position

Parameters:

Name	Description	Valid Value
image	the image to add on the page	can't be null
point	location of the image	x>=0 && x<=page.width y>=0 && y<=page.height

Save

RasterEdge.XDoc.DICOM dll allows developer to save the DICOM document object to file path, stream and byte array.

```
C#
//load DICOM file Document object from file path
String inputPath = @"F:\input.dcm";
DCMDocument dcmDoc = new DCMDocument(inputPath);
//save the DICOM Document object to the file path
dcmDoc.Save(@"F:\output.dcm");
```

Related API(s) (**DCMDocument.cs**):

public override void Save(string filePath);

Descriptions:

Save dicom document object to the given file path.

Parameters:

Name	Description	Valid Value
filePath	output file path	-

public override byte[] SaveToBytes();

Descriptions:

Save dicom document object to byte array.

Return:

Null if failed.

public override void SaveToStream(Stream stream)

Descriptions:

Save dicom document object to stream

Parameters:

Name	Description	Valid Value
stream	output stream	a valid memory stream or file stream