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**INTERACTIVE IMAGE AND TEXT EDITING USING .NET**

A PROJECT REPORT

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**ABSTRACT**

The Project "INTERACTIVE IMAGE AND TEXT EDITING USING .NET" is an editor, by which we can edit both the picture and text at the same time. In this, we can create the document with both picture and text. And also, we have the option that can save the picture with the text in the same file or can save the picture alone in the separate folder, even text is present in the document.

We can modify the existing picture and can save that modified picture in various extensions such as .bmp, .jpeg, .tif, etc., We can modify the existing picture by various options like rotating the image, cropping the image, etc., We can view the information about a particular file or a particular directory such as its creation date, its last modified date and its last accessed date. We can insert the existing file into the document. We can save both text and the picture in .rtf format.

This is implemented by using "MICROSOFT VISUAL STUDIO .NET – VISUAL BASIC .NET".

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## LIST OF ABBREVIATIONS

S.No	ABBREVIATION	EXPANSION
1)	SRS	Software Requirement Specification
2)	BMP	Bitmap
3)	JPEG	Joint Pictures Experts Group
4)	RTF	Rich Text Format
5)	XML	eXtensible Markup Language
6)	CLR	Common Language Runtime
7)	CLS	Common Language Specifications
8)	BCL	Base Class Library
9)	MSIL	Microsoft Intermediate Language
10)	COM	Component Object Model
11)	DLL	Dynamic Link Library
12)	API	Application Programming Interface
13)	TIF	Tagged Image File

## 1. INTRODUCTION

### 1.1 PROBLEM DESCRIPTION:-

The Project “**INTERACTIVE IMAGE AND TEXT EDITING USING .NET**” is an editor, where we can edit both the picture and text at the same time.

In this, we can create the document with both picture and text. And also, we have the option that can save the picture with the text in the same file or can save the picture alone in the separate folder, even text is present in the document.

We can modify the existing picture and can save that modified picture in various extensions such as .bmp, .jpeg, .tif, etc., We can modify the existing picture by various options like rotating the image, cropping the image, etc.,

We can view the information about a particular file or a particular directory such as its creation date, its last modified date and its last accessed date. We can insert the existing file into the document. We can save both text and the picture in .rtf format.

This is implemented by using “**MICROSOFT VISUAL STUDIO .NET 2003 – VISUAL BASIC .NET**”, which is going to be discussed in Chapter 4.

### 1.2 SYSTEM REQUIREMENTS:-

#### 1.2.1 HARDWARE REQUIREMENTS:-

Processor	: Pentium – IV ( 1.6 GHz)
Keyboard	: 102 Keys Keyboard
Mouse	: ScrollBar Mouse
Monitor	: 15” SVGA Monitor
Hard Disk	: 10GB ( Maximum )
RAM	: 128 MB RAM ( Minimum )

#### 1.2.2 SOFTWARE REQUIREMENTS:-

Operating System	: Windows 98 and Higher Versions
Software Used	: Microsoft Visual Studio .NET 2003

## 2. EXISTING SYSTEM AND PROPOSED SYSTEM

### 2.1 EXISTING SYSTEM:-

At present, there are so many editors for text editing like MS – Word and image editing like MS – Paint, Adobe Photoshop, etc., but, we can't edit text and image in the same editor. We can edit text and image as user's wish. The current text - editor has editing features like aligning, cut, copy, paste, deleting un-necessary text, formatting font styles, bullets and numbering, inserting tables, inserting pictures, etc., and the current image – editor has editing features like cropping the portion of the picture that we want, rotating the image, etc., And there are some limitations in those editors. Let us discuss those limitations.

### 2.2 LIMITATIONS OF EXISTING SYSTEM:-

- Editing text and image which are present in the same document is not possible.
- Saving the picture in the separate file is not possible when the picture is present along with the text.
- Viewing the information about the particular file and the particular directory is not possible.
- Inserting any existing file into the document is not possible.
- Cascading and tile windows are not available.
- Text cannot be viewed with Background.

### 2.3 PROPOSED SYSTEM:-

The proposed system named, "INTERACTIVE IMAGE AND TEXT EDITING USING .NET", overcomes the above limitations which are discussed above. In this editor, the features like saving the picture along with the text with .rtf extension, saving the picture alone with .bmp, .jpeg, .tif, etc.,

### 2.4 ADVANTAGES OF PROPOSED SYSTEM:-

- Editing text and image which are present in the same document is possible.
- Saving the picture in the separate file is possible when the picture is present along with the text.
- Viewing the information about the particular file and the particular directory is possible.
- Inserting any existing file into the document is possible.
- Cascading and tile windows are available.
- Text can be viewed with Background.

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### 3. SYSTEM ANALYSIS

#### 3.1 PROJECT PLAN:-

The requirement phase deals with the sequence of activities in producing the Software Requirement Specification (SRS) document. It must be ensured that all the requirements of the software are elicited and analyzed. In other words the needs of the system are identified.

In the problem analysis phase, the current system is analyzed by study of the existing materials, and the changes to be made in the proposed system are decided upon. A clear understanding of the needs of the system must be framed. Analysis leads to actual specification.

Designing aims at how to satisfy the needs of the system. The different modules of the system and the interaction between these modules to produce the desired functionality are identified. During detailed design, the internal logic of each module and their algorithmic design is specified. The major and important decisions are made in this phase.

Coding is the process of translating the design into code. The code developed must be easy to understand. Well-written code can reduce testing and maintenance effort.

Testing is done to check if the requirements of the user are met. It also involves in checking the functionality of each module as per the design document.

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### 3.2 TESTING:-

Testing is done to detect the errors in the software. This implies not only to the coding phase but to uncover errors introduced in all the previous phases.

The following are the types of tests that were performed-

#### ➤ Unit Testing:-

Each and every module is tested separately to check if its intended functionality is met. Some unit testing performed are,

1. Paralleling the application to independent sub task.
2. Checking for the transmission of the sub-task to its destination system.
3. Receiving this task and examining whether correct data is received.
4. Computing the received task.
5. Sending the computed result to the server.
6. In the server side, again combining the results from various systems.
7. Converting the result to user required format.

#### ➤ Integration Testing:-

It is the testing performed to detect errors on interconnection between modules. Here, the process of sub-dividing the task and then sending it to other system for computing are combined for examining. The system receiving the task has to perform functions like receiving the allotted task, computing it and sending the result back

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in specified format. All these events when done together must satisfy its purpose.

#### ➤ System Testing:-

The system is tested against the system requirements to see if all the requirements are met and if the system performs as per the specified requirements. The system is tested as a whole to check for its functionality.

#### ➤ Validation Testing:-

This test is done to check for the validity of the entered input. The input got is the size of the matrix. Validation is done that without entering any value, the next step cannot be proceeded. Then entered value must be only numerals. If any character is entered an alert message must be given to the user.

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**3.3 SOFTWARE REQUIREMENT SPECIFICATION:-**

**3.3.1 INTRODUCTION:-**

**3.3.1.1 PURPOSE:-**

The purpose of this document is to specify the requirements of project "Interactive Image and Text Editing using .Net". It is an editor by which we can edit the text and image in the same document and can save the text with the picture or separately. The document also bridges the communication gap between the customer and the analyst.

**3.3.1.2 SCOPE:-**

SRS forms the basics for agreement between the client and the supplier and what the software product will do. It also provides a reference for the validation of the final project.

Any changes made to the SRS in the future will have to go through formal change approval process.

**3.3.2 DEFINITION:-**

**3.3.2.1 CUSTOMER:-**

A person or organization, internal or external to the producing organization, who takes financial responsibility for the system. In a large system this may not be the end user.

modify the existing picture and can save that modified picture in various extensions such as .bmp, .jpeg, .tif, etc., We can save both the text and the picture with .rtf extension.

**3.3.2.2 USER CHARACTERISTICS:-**

The main users of the system are technically knowledge person in the organization, enough to handle the project requirements.

**3.3.2.3 GENERAL CONSTRAINTS:-**

The system will run only on windows platform ( Windows 98 and Higher Versions ).

**3.3.4 SPECIFIC REQUIREMENTS:-**

**3.3.4.1 SOFTWARE CONSTRAINTS:-**

The system runs on windows platform. Requires .Net Framework Should be installed. At the same time, a large number of users can use the application.



**3.3.2.2 USER :-**

A person who will use the application that is developed.

**3.3.2.3 ANALYST :-**

The Analyst details the specification of the system's functionality by describing the requirements aspect and other supporting software requirements.

**3.3.2.4 ABBREVIATION:-**

S. No	ABBREVIATION	EXPANSION
1)	SRS	Software Requirement Specification
2)	BMP	Bitmap
3)	JPEG	Joint Pictures Experts Group
4)	RTF	Rich Text Format
5)	TIF	Tagged Image File Format

**3.3.3 GENERAL DESCRIPTION:-**

**3.3.3.1 PRODUCT OVERVIEW:-**

This is an editor, by which we can edit both the picture and text at the same time. In this, we can create the document with both picture and text. And also, we have the option to save the picture with the text in the same file or can save the picture alone in the separate folder, even text is present in the document. We can

**4. SOFTWARE STUDY**

**4.1 INTRODUCTION:-**

.NET is Microsoft's platform for the next generation of software that connects our world of information, devices and people in a unified, personalized way. The .NET platform enables the creation and use of various applications, processes and services that share and combine information and functionality with each other by design, on any platform or smart device, to provide tailored solutions for organizations and individual people. .NET is a comprehensive family of products, built on industry and Internet standards, that provide for each aspect of developing (tools), managing (servers), using (building block services and smart clients) and experiencing (rich user experiences) XML Web services. .NET will become part of the Microsoft applications, tools, and servers you already use today – as well as new products that extend XML Web service capabilities to all of your business needs.

**4.2 WHAT IS MICROSOFT .NET:-**

Microsoft is creating an advanced new generation of software that melds computing and communications in a revolutionary new way, offering every developer the tools they need to transform the Web and every other aspect of the computing experience. This initiative is called Microsoft .NET, and for the first time it enables developers, businesses and consumers the ability to harness technology on their terms. Microsoft .NET will allow the creation of truly distributed Web Services that will integrate and collaborate with

a range of complementary services to serve customers. Microsoft .NET will drive the Next Generation Internet. It will make information available any time, any place and on any device.

#### 4.3 MICROSOFT .NET PROGRAMMING MODEL:-

The Microsoft .NET programming model gives developers the opportunity to focus fewer resources on where or how an application runs and focus more resources on what the application does - where they can add real value. Microsoft .NET addresses some of the biggest challenges facing developers, particularly the tradeoff between functionality and manageability. In addition, developers will be able to leverage and customize a range of core Microsoft .NET building block services in their own applications and services, reducing the effort required to create compelling products.

Visual Studio.NET represents the complete development environment for building applications on the Microsoft .NET platform. With Visual Studio.NET, developers can build Web applications and XML Web services that render in any browser and on virtually any device. By using the language of their choice, developers can leverage their existing investments in skills and systems. The result is increased productivity, end-to-end Web development, and a shorter time to delivery.

#### 4.5 THE IMPROVING TECHNOLOGY:-

Microsoft .NET supports high levels of integration with existing infrastructures and applications. It provides new technologies and evolves existing ones, enabling you to draw upon the existing experience of your staff. It also uses your existing hardware and supports scaling up and scaling out as your needs demand.

A key premise of Microsoft .NET is integrating applications. As a result managing integration is critical to its success. By enabling customers to better monitor and control their computing resources, Microsoft is providing the basis for managing distributed computing as an integral part of all Windows-hosted environments.

Microsoft .NET addresses most of today's computing deficiencies to realize the vision of enabling access to all user's data and applications anywhere and from any device; allowing users to interact with their data through handwriting, speech, and vision technologies.

Microsoft's vision for this new generation of distributing computing on the Internet is one where software is delivered as a service, accessible by any device, any time, any place, and is fully programmable and personalized. To enable this vision, Microsoft is delivering the .NET platform and .NET experiences, built on public Internet standards and protocols, with tools and services that integrate computing and communications in productive new ways.

The Microsoft .NET platform is explicitly designed to enable the rapid development and integration of any group of XML Web services and applications into a single solution.

#### 4.4 THE .NET PLATFORM:-

From a technology standpoint, .NET is the platform and the .NET experiences built on top of the platform. The platform includes:

- **Tools** – to build applications and XML Web services (.NET Framework and Visual Studio.NET).
- **Servers** – on which to build, host and deploy those applications and services (Windows 2000 Server and the .NET Enterprise Servers).
- **Services** – a core set of .NET building block services.
- **Client software** – the software that powers smart devices, allowing users to interact and experience the .NET platform.
- **Experiences** – the combination of the above components of the .NET platform allow for more personal, integrated user experiences -- .NET experiences.

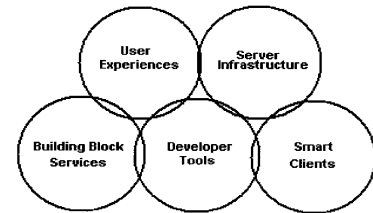


Fig 4.1. Core Components of .NET

#### 4.6 MICROSOFT .NET FRAMEWORK ARCHITECTURE:-

The core components of the .NET Framework are described below.

- **The Common Language Runtime (CLR).** The CLR is the execution engine for .NET Framework applications. It provides a number of services including the loading and execution of code, application memory isolation, memory management, exception handling, access to metadata (enhanced type information), and the conversion of MSIL (Microsoft Intermediate Language) to native platform code.
- **The Base Class Library (BCL).** The BCL provides an extensive set of classes, logically grouped into hierarchical namespaces that provide access to the underlying features of the operating system.
- **ADO.NET.** This is an evolutionary update to the ActiveX Data Objects (ADO) data access technology, with significant improvements aimed at the disconnected nature of the Web.
- **ASP.NET.** This is an advanced version of Active Server Pages (ASP) for Web application development (using Web Forms) and Web service development.
- **The Common Language Specification (CLS).** This is responsible for making many of the aforementioned technologies available to all languages that support the

.NET Framework. The CLS itself is not a technology, and there is no source code to it. It defines a set of rules providing a contract that governs the interoperability between language compilers and libraries.

- **Win Forms.** This programming model and control set provide a robust architecture for Windows-based application development.
- **Visual Studio.NET.** This delivers the tools allowing you to exploit the framework's features to create concrete applications.

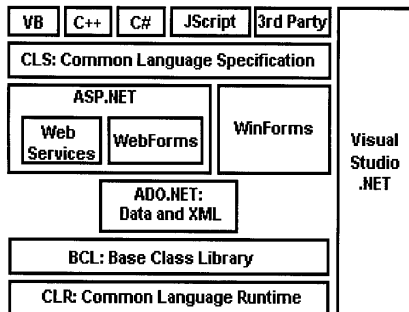


Fig 4.2. Microsoft .Net Framework Architecture

classes of the .NET Framework (provided within the Base Class Library or BCL) provide a unified, object-oriented, hierarchical, extensible set of class libraries for developers to use. The .NET Framework unifies the disparate frameworks that we need to work with today. As a result, you no longer have to learn multiple frameworks to do our work. As a component developer, we don't have to decide what language to target, as we can simply target the CLR, knowing that our work will be accessible from all languages.

#### 4.7.3 CROSS - LANGUAGE INTEROPERABILITY:-

Among the many strengths of .NET is language transparency. Whichever managed language we choose, we have equal access to the platform. The .NET Framework enables cross-language inheritance, error handling, and debugging. As a developer, we can take advantage of the .NET platform using your preferred language.

#### 4.7.4 MULTI – PLATFORM DESIGN:-

.NET represents a new way of developing software for Windows and potentially other platforms. .NET is not inextricably tied to the Windows operating system. For example, the intermediate code (MSIL) generated by .NET language compilers, is not processor specific and the BCL classes are designed to work on any operating system. .NET also allows your application to easily span platforms because of its interoperability and extensibility features.

#### 4.7 FEATURES:-

##### 4.7.1 COMMON LANGUAGE RUNTIME:-

The Common Language Runtime (CLR) plays a role in both the development and execution of .NET applications. At runtime, the CLR is responsible for managing the execution environment of .NET (managed) code, including memory allocation and thread management, as well as enforcing security policies. Because the CLR automates these development tasks, development time is reduced and development tasks are simplified. Some of the key components of the CLR are shown in Figure below.

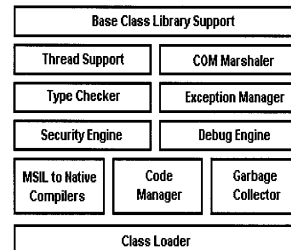


Fig 4.3. Components of Common Language Runtime

##### 4.7.2 MULTILANGUAGE AND EXTENSIBLE:-

The critical role of the runtime in the .NET Framework (and what really sets it apart) is that it provides a unified environment across all programming languages. The base

#### 4.8 ADVANTAGES OF USING .NET FRAMEWORK:-

Here are some of the advantages provided by the .NET Framework:

- **Consistent programming model.** All application services are accessed through a common object-oriented programming model, unlike today where some operating system facilities are accessed via DLL functions and other facilities are accessed via COM objects.
- **Simplified programming model.** .NET seeks to greatly simplify the plumbing and arcane constructs required by Win32 and COM.
- **Run once, run always.** All developers are familiar with DLL Hell. Since installing components for a new application can overwrite components of an old application, the old application can exhibit strange behavior or stop functioning altogether. The .NET architecture now separates application components so that an application always loads the components with which it was built and tested. If the application runs after installation, then the application should always run.
- **Execute on many platforms.** Once written and compiled to MSIL, a managed .NET application can execute on any platform that supports the .NET CLR

(including non-Windows based platforms). You immediately appreciate the value of this broad execution model when you need to support multiple computing hardware configurations or operating systems.

- **Language integration.** While COM allows different programming languages to interoperate with one another, .NET allows languages to be integrated with one another. For example, it is possible to create a class in C# that derives from a class implemented in Visual Basic.NET. .NET can enable this because it defines and provides a Common Type System (CTS) common to all .NET languages. The Microsoft Common Language Specification (CLS) describes what compiler vendors must do in order for their languages to integrate with other languages. Microsoft is providing several compilers that produce code targeting the .NET CLR: C++ with Managed Extensions, C#, Visual Basic.NET (which now subsumes Visual Basic Scripting Edition and Visual Basic for Applications (VBA)), and JScript. In addition, companies other than Microsoft are producing compilers for other languages that also target the .NET CLR.
- **Code reuse.** Using the mechanisms just described, you can create your own classes that offer services to third-party applications. This of course, makes it

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is no way to construct an arbitrary reference to a memory location and cause code at that location to begin execution. Type safety and a lack of direct pointer manipulation form the basis of the security model, and they also eliminate many common programming errors and classic system attacks such as the exploitation of buffer overruns.

- **Rich debugging support.** Because the .NET CLR is the common basis for many languages, it is now much easier to implement components in your application developed using the language that's best suited for each of them. The .NET CLR fully supports debugging across components written in multiple languages. For example, you can step into the source code of a control written in C#, from a Visual Basic.NET client program.
- **Consistent error handling.** One of the most frustrating aspects of programming on the Windows platform is the inconsistent way in which errors are reported. Some functions return Win32 error codes, some return HRESULTS, and some raise exceptions. In .NET, all errors are reported via exceptions. Normal program execution stops when an exception occurs, and an appropriate exception handler is sought. Exceptions also allow you to isolate the error-handling code from other program logic. This greatly simplifies writing, reading, and maintaining code. In

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extremely simple to reuse code and broadens the market for component vendors.

- **Automatic resource management through garbage collection.** Programming requires great skill and discipline. This is especially true when it comes to managing resources such as files, memory, network connections, database resources, and so on. One of the most common types of bug occurs when an application neglects to free one of these resources, causing that application or another to fail. The .NET CLR automatically tracks resource usage, guaranteeing that your application never leaks resources. This is called garbage collection. There is no way to explicitly free a memory resource, as it is automatically garbage collected when it is no longer required.
- **Type safety.** The .NET CLR can verify that all your code is type safe. Type safety ensures that allocated objects are always accessed in compatible ways. Hence, if a method input parameter is declared as accepting a 4-byte value, the CLR detects and traps attempts to pass an 8-byte value using this parameter. Similarly, if an object occupies 10 bytes in memory, the application can't coerce this into a form that allows more than 10 bytes to be read. Type safety also means that execution flow will only transfer to well-known locations (namely, method entry points). There

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addition, exceptions work across module and language boundaries.

- **Deployment.** Today, Windows-based applications can be incredibly difficult to install and deploy. There are usually multiple files, registry settings, and shortcuts that need to be created. In addition, completely uninstalling an application is nearly impossible. With Windows 2000, Microsoft introduced the Windows Installer, a new installation engine that helps with these issues, but it is still possible that a company authoring a Microsoft Installer Package may fail to do everything correctly. .NET seeks to completely overcome these issues. .NET components are not referenced in the registry, and installing most .NET-based applications requires no more than copying the files to a directory. Uninstalling a .NET application is as easy as deleting those files. Also, the CLR allows side-by-side deployments where, for example, you can have two versions of the same application running at the same time on the same machine while you migrate your users.

#### 4.9 NAMESPACES IN .NET:-

The Base Class Library (BCL) is included in .NET as a base framework assembly that contains many class definitions, where each class exposes a feature of the underlying platform. Since Microsoft defines hundreds of classes in the BCL, the library is

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divided into namespaces that logically group related classes together. For example, the System namespace contains the base class, Object, from which all other classes ultimately derive. In addition, the System namespace contains classes for exception handling, garbage collection, console I/O, as well as a variety of utility classes that perform type safe conversions, format data types, generate random numbers, and perform various math functions.

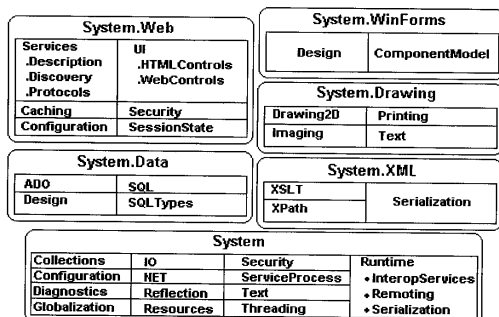


Fig 4.4. Base Class Library Namespaces

To access any of the platform's features, you need to work with the relevant classes defined within these namespaces. If you want to customize the behavior of any system provided class, you can simply derive your own class from it.

We can freely pass data types to and from components developed in other languages and inherit from base classes developed in other languages. IntelliSense also works with any component regardless of development language. Visual Basic.NET supports ADO.NET for data access, the Windows Forms programming model, multithreading and new and improved wizards and designers.

Existing Visual Basic developers will benefit from learning the new language constructs and features, allowing them to develop more powerful and robust applications. However, we don't have to upgrade all of our code straight away, as Visual Basic 6 code and Visual Basic .NET code will happily run side by side. If we do choose to upgrade, COM Interoperability services will greatly help with a phased transition, allowing you to seamlessly use your existing components. Visual Basic .NET also provides an Upgrade Wizard, which steps you through the upgrade process and performs the necessary language syntax changes when a Visual Basic 6 project is loaded.

The primary new features introduced by Visual Basic.NET include:

- **Inheritance.** Through implementation inheritance, classes can extend (or inherit from) an existing base class. Visual Basic.NET (in common with all .NET languages) only supports single inheritance, meaning that we can only inherit from a single base class. The

#### 4.10 AUTOMATIC MEMORY MANAGEMENT:-

The .NET Framework advances the features of COM+ resulting in much higher developer productivity. For example, the .NET Framework introduces automatic memory management, regardless of the programming language. It also provides you with a single, unified programming framework that brings together the best features of the Windows Foundation Classes, the Microsoft Foundation Classes, the Visual Basic APIs, and augments them with other capabilities including advanced data access architecture.

The .NET Framework also uses the same underlying component services that COM+ provides today, with features such as transactions, queuing, and object pooling. In future versions, it will also provide a feature called partitioning. This provides stronger process isolation and is designed for application service providers. COM+ is the highest-performance, most feature-rich set of application services available today.

#### 4.11 VISUAL BASIC .NET:-

Based on the .NET Type System, Visual Basic.NET offers a number of significant improvements over previous versions of Visual Basic. The main ones relate to its support for the object oriented notions of polymorphism, inheritance, and method and operator overloading. Others come from its common foundation with other languages provided by the CLS.

new class can obtain the functionality and behavior of the base class, and choose to adapt behavior where appropriate. A derived class can also choose to provide new behaviors, for example by implementing new methods. To use implementation inheritance, you declare the new class and use the Inherits keyword to express which base class the new one derives from. You then use the Overrides keyword to modify the base class' functionality where appropriate. Note that a method that is capable of being overridden in a derived class must be marked as Overridable in the base class.

- **Polymorphism.** This is the ability to treat objects of different class types in the same way. Traditionally, we could achieve this in Visual Basic using interfaces. While Visual Basic .NET still supports polymorphism through interfaces, it can now also be achieved using inheritance.
- **Constructors.** Constructors allow an object to be created and initialized to an initial state in a single operation. This alleviates the need to create an object, and then call a separate method to initialize it. In Visual Basic .NET, object constructors allow you to pass values to an object as it is being created. This simplifies coding and helps reduce errors when working with objects.

- **Initializers.** Initializers allow you to declare a variable and provide it with an initial value in a single line of code. This leads to smaller, simpler, more maintainable code:
- **Structured Error Handling.** The .NET CLR uses exceptions to handle error conditions in a consistent way, irrespective of the programming language you use. Exceptions are responses to failure conditions that can occur while an application is running. They can either be generated by the .NET runtime (system exceptions) or can be created programmatically (application exceptions). Exceptions can be propagated across language boundaries. For example, a component written in C# could generate an exception which could subsequently be caught and handled by a client program developed with Visual Basic.NET.

#### 4.12 CONCLUSION:-

With .NET, the Internet more fully becomes a platform for business. Microsoft .NET addresses most of today's computing deficiencies to realize the vision of enabling access to all user's data and applications anywhere and from any device; allowing users to interact with their data through handwriting, speech, and vision technologies. The Microsoft .NET platform is explicitly designed to enable the rapid development and integration.

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- To view the preview of the document and to take printout of the document.

#### 5.2 EDIT FUNCTIONS:-

The Edit menu consists of the following functions,

- Cut, Copy and Paste the selected items in the document including picture.
- Deleting the selected text in the document.
- Find the particular word in the document and replacing the particular word by another word.
- To select all items in the document.

#### 5.3 VIEW FUNCTIONS:-

The View menu consists of the following functions,

- To view the whole document in normal or in page view.
- To view the statusbar, toolbar, ruler and buttonbar.
- Zoom - in and Zoom - out facility.

#### 5.4 INSERT FUNCTIONS:-

The Insert menu consists of the following functions,

- To insert an already created file into the document.
- To insert an image into the document.
- To insert page break.

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## 5. FEATURES OF THE EDITOR

The Project "INTERACTIVE IMAGE AND TEXT EDITING USING .NET" is an editor, by which we can edit both the picture and text at the same time. In this, we can create the document with both picture and text.

And also, we have the option that can save the picture with the text in the same file or can save the picture alone in the separate folder, even text is present in the document. We can modify the existing picture and can save that modified picture in various extensions such as .bmp, .jpeg, .tif, etc.,

The functions that included in our project are as follows:-

- File Functions
- Edit Functions
- View Functions
- Format Functions
- Insert Functions
- Table Functions
- Window Functions
- Information Functions

#### 5.1 FILE FUNCTIONS:-

The File menu consists of all basic functions as follows,

- To create a new file.
- To open an already existing file.
- To save both the text and the picture with .rtf format and other extensions.

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#### 5.5 FORMAT FUNCTIONS:-

The Format menu consists of the following functions,

- To change the font style and color of the text ( both backcolor and forecolor ), and to change the background color of the document.
- To change the tab settings, paragraph settings including line spacing, alignment options and bullet settings.
- To change the option whether the picture file can be saved along with the document or as a separate file.
- To edit an image and save it in a separate file.

#### 5.6 TABLE FUNCTIONS:-

The Table menu consists of the following functions,

- To insert and delete tables, selected rows and selected columns.
- To select the whole table, necessary rows and necessary columns.
- To view the gridlines of the table.
- To change the properties of the table such as changing the background color, to change the line width and so on.

#### 5.7 INFORMATION FUNCTIONS:-

The Information menu consists of the following function,

- To view the information about the particular file and particular directory such as its created date, its last modified date and its last accessed date.

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## 5.8 WINDOW FUNCTIONS:-

The Window menu consists of the following functions,

- The child Windows can be viewed either in a cascade manner or in a tiled manner.
- We can work at all the windows simultaneously.

## 5.9 EXTRA FEATURES:-

- The toolbar is placed with appropriate buttons to perform file new, file open, file save, page preview, file print, cut, copy, paste, undo, redo and find functions.
- The buttonbar is placed with appropriate buttons to perform alignment operations, bulleting text, numbering text, zooming in and out, to change the font style of the text and font size of the text.
- The statusbar is placed with various panels to show the current page number, line number in the page, the character number in the line, zooming in and out status and the indication of num and caps lock keys.

## 5.10 UNIQUE FEATURES OF THE EDITOR:-

- Editing text and image which are present in the same document is possible.
- Saving the picture in the separate file is possible when the picture is present along with the text.
- Viewing the information about the particular file and the particular directory is possible.
- Inserting any existing file into the document is possible.

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- Cascading and tile windows are available.
- Text can be viewed with Background.

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## 6. SYSTEM TESTING AND IMPLEMENTATION

### 6.1 SYSTEM TESTING:-

The system testing deals with the process of testing the system as a whole. This is done after the integration process. The entire system is tested by moving through each module from top to bottom. The verification and validation processes are then carried out. The errors that occur at testing phase are eliminated and a well functioning system is developed.

Test case design focuses on a set of techniques, which meets all testing objectives which are mentioned below.

- Testing is a process of executing a program with the intend of finding an error.
- A successful test is one that uncovers an as yet undiscovered error.

Testing demonstrates that software functions work according to specifications. In addition data collected from testing provides a good indication of software reliability and some indication of software quality as a whole. Testing results in the deduction in the number of errors. Critical modules are tested as early as possible. The following testings are carried out.

### 6.2 IMPLEMENTATION:-

The Implementation phase of software development is concerned with translating design specification into source code. The primary goal of implementation is to raise source code and internal documentation so that conformance of the code to its specification can be easily verified, and so that debugging, testing

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and modification are eased. This goal can be achieved by making the source code as clear and straightforward as possible. Simplicity, clarity and elegance are the hallmarks of good programs; obscurity, cleverness and complexity are indication inadequate design and misdirected thinking.

Source code clarity is enhanced by structured coding techniques, by good coding style, by appropriate supporting documents, by good internal comments and by the features provided in modern programming languages.

The goal structured coding is to liberalize control flow through a computed program so that the execution sequence follows the sequence in which the code is written. The dynamic structure of a program as it executes then resembles the static structure of the written text. This enhances readability of code, which eases understanding, debugging, testing, documentation and modification of programs. It also facilitates formal verification of programs. The structure coding techniques are as follows:

- Single entry, Single exit constructs
- Efficiency considerations
- Data encapsulation
- Recursion

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### 6.3 MAINTENANCE:-

Maintenance is the enigma of system development. It holds the software industry captive typing up programming resources. It could be described as the symmetric process of changing the software that is already in operation. Software maintenance involves keeping software interfaces simple and standard, paying particular attention to troublesome modules, replacing faulty components and generally planning to replace components that are old, obsolete, faulty, or at risk for imminent failure.

There are several factors that require to be maintained. They are,

- Hardware platforms change or become obsolete.
- Operating system change.
- Compiler change.
- Language standard's change.
- Communication standard's change.
- Graphical user interface change.
- Related application software package change.

Maintenance can be classified into

- Adaptive maintenance
- Perceptive maintenance
- Preventive maintenance
- Corrective maintenance

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## 7. FUTURE ENHANCEMENTS

### 7.1 FEATURES WHICH WE ARE PROVIDED:-

- Editing text and image which are present in the same document is possible.
- Saving the picture in the separate file is possible when the picture is present along with the text.
- Viewing the information about the particular file and the particular directory is possible.
- Inserting any existing file into the document is possible.
- Cascading and tile windows are available.
- Text can be viewed with Background.

### 7.2 THE POSSIBLE FUTURE ENHANCEMENTS:-

- The image can also be drawn in the same document.
- The image – editing tools like cloning the image, merging the image and changing the color of the image can also be added in the future.
- The image can be edit in the same page of the document.
- Word Dictionary can also be included.
- Translation of English documents into other languages can also be possible.

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### 6.3.1 ADAPTIVE MAINTENANCE:-

It deals with adapting software change in the environment. It does not lead to changes in the system functionality.

### 6.3.2 PERCEPTIVE MAINTENANCE:-

It mainly deals with accommodating new or changed users requirements. It also includes activities to increase the system performance or to enhance its user interface. The objective of perceptive maintenance should be to prevent failures and optimize the software.

### 6.3.3 PREVENTIVE MAINTENANCE:-

Preventive maintenance concerns activities aimed at increasing the system's maintainability such as updating documentation adding comments, improving modular structure of the system.

### 6.3.4 CORRECTIVE MAINTENANCE:-

This deals with the repair of faults found. Some of the major causes of maintenance problems are,

- Unstructured code
- Maintenance programmers having insufficient knowledge of the system and on application domain.

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## 8. CONCLUSION

Thus, an editor with the facilities like editing picture and text, creating the document with both picture and text, saving the picture with the text in the same file, saving the picture alone in the same folder, modifying the existing picture by various options like rotating, cropping, etc., is implemented by using "Microsoft Visual Studio .NET – Visual Basic .NET".

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## 9. APPENDIX

### APPENDIX – A :: SAMPLE CODE

#### CODE FOR IMAGE – EDITING:-

```
Private Sub mnuFileOpen_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
mnuFileOpen.Click
    Open.InitialDirectory = "C:\\"
    Open.Filter = "All Image Formats
        (*.bmp;*.jpg;*.jpeg;*.gif;*.tif) & _
            *.bmp;*.jpg;*.jpeg;*.gif;*.tif|Bitmaps
        (*.bmp)|*.bmp| & _
            "GIFs (*.gif)*.gif|JPEGs
        (*.jpg)*.jpg;*.jpeg|TIFs (*.tif)*.tif"
    Open.FilterIndex = 1
    If Open.ShowDialog() = DialogResult.OK Then
        P1.Width = PICTUREBOX_WIDTH
        P1.Height = PICTUREBOX_HEIGHT
        P1.Image = Image.FromFile(Open.FileName)
        P1.SizeMode = PictureBoxSizeMode.Normal
        optNormal.Checked = True
    End If
End Sub

Private Sub mnuFileSave_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
mnuFileSave.Click
    Save.InitialDirectory = "C:\\"
```

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```
        strMsg = "Image successfully saved to
            " & Save.FileName
    End If
    MessageBox.Show("Image successfully
        saved to " & Save.FileName, Me.Text,
        MessageBoxButtons.OK,
        MessageBoxIcon.Information)
End Sub

Private Function GetImageFormat() As ImageFormat
    Select Case Save.FilterIndex
        Case 1
            Return ImageFormat.Bmp
        Case 2
            Return ImageFormat.Jpeg
        Case 3
            Return ImageFormat.Gif
        Case Else
            Return ImageFormat.Tiff
    End Select
End Function

Private Sub mnuFileExit_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
mnuFileExit.Click
    Me.Hide()
End Sub
```

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```
Save.Filter = "Bitmap (*.bmp)*.bmp"
If Save.ShowDialog() = DialogResult.OK Then
    Dim strMsg As String
    P1.Image.Save(Save.FileName)
    strMsg = "Image successfully saved
        to " & Save.FileName
End If
    MessageBox.Show("Image successfully saved
to " & Save.FileName, Me.Text, _
    MessageBoxButtons.OK, MessageBoxIcon.Inform
ation)
End Sub

Private Sub mnuFileSaveAs_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
mnuFileSaveAs.Click
    Save.InitialDirectory = "C:\\"
    Save.Filter = "Bitmap (*.bmp)|*.bmp|GIF
        (*.gif)*.gif| & _
            "JPEG (*.jpg)*.jpg;*.jpeg|TIF
        (*.tif)*.tif"
    If Save.ShowDialog() = DialogResult.OK Then
        Dim strMsg As String
        P1.Image.Save(Save.FileName,
            GetImageFormat())
```

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```
Private Sub cmdFit_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
cmdFit.Click
    grpSizeMode.Enabled = True
    P1.Width = PICTUREBOX_WIDTH
    P1.Height = PICTUREBOX_HEIGHT
    P1.SizeMode = PictureBoxSizeMode.StretchImage
    optStretchImage.Checked = True
    Fit()
End Sub

Private Sub Fit()
    If P1.Image.Width < P1.Width And _
        P1.Image.Height < P1.Height Then
        If Not IsFitForZoomIn Then
            P1.SizeMode =
                PictureBoxSizeMode.CenterImage
        End If
    End If
    CalculateAspectRatioAndSetDimensions()
End Sub

Private Function
CalculateAspectRatioAndSetDimensions() As Double
    Dim ratio As Double
    If P1.Image.Width > P1.Image.Height Then
        ratio = P1.Image.Width / _
```

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```

        P1.Image.Height
        P1.Height = CInt(CDb(P1.Width) / ratio)
    Else
        ratio = P1.Image.Height / _
        P1.Image.Width
        P1.Width = CInt(CDb(P1.Height) / ratio)
    End If
    Return ratio
End Function
Private Sub btnCrop_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
btnCrop.Click
If IsValidCropValues() Then
    imgUndo = P1.Image
    btnUndo.Enabled = True
    Dim rec As New Rectangle(CInt(txtXCoord.Text),
        CInt(txtYCoord.Text), CInt(txtWidth.Text),
        CInt(txtHeight.Text))
    Dim bmp As New Bitmap(CInt(txtWidth.Text),
        CInt(txtHeight.Text))
    Dim gr As Graphics =
        Graphics.FromImage(bmpCropped)
    gr.DrawImage(P1.Image, 0, 0, rec,
        GraphicsUnit.Pixel)
    P1.Image = bmp
End If
End Sub

```

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```

Private Sub btnUndo_Click(ByVal sender As System.Object,
ByVal e As System.EventArgs) Handles btnUndo.Click
    P1.Image = imgUndo
    P1.Refresh()
    btnUndo.Enabled = False
End Sub

```

```

Private Sub cmdZoomIn_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
cmdZoomIn.Click
If grpSizeMode.Enabled Then
    P1.SizeMode = PictureBoxSizeMode.AutoSize
End If
grpSizeMode.Enabled = False
cmdFit.Enabled = True
IsFitForZoomIn = True

P1.SizeMode = PictureBoxSizeMode.StretchImage
Fit()

P1.Width = CInt(P1.Width * 1.25)
P1.Height = CInt(P1.Height * 1.25)
End Sub

```

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```

Private Sub cmdRotateLeft_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
cmdRotateLeft.Click
    P1.Image.RotateFlip(RotateFlipType.Rotate270FlipNone)
    P1.Refresh()
End Sub

Private Sub cmdRotateRight_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
cmdRotateRight.Click
    P1.Image.RotateFlip(RotateFlipType.Rotate90FlipNone)
    P1.Refresh()
End Sub

Private Sub btnShowBox_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
btnShowBox.Click
If IsValidCropValues() Then
    P1.Refresh()
    Dim recCropBox As New
        Rectangle(CInt(txtXCoord.Text), _
        CInt(txtYCoord.Text), CInt(txtWidth.Text),
        CInt(txtHeight.Text))
    P1.CreateGraphics.DrawRectangle(Pens.Red,
        recCropBox)
End If
End Sub

```

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```

Private Sub cmdZoomOut_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
cmdZoomOut.Click
    grpSizeMode.Enabled = False
    cmdFit.Enabled = True
    Fit()
    P1.SizeMode = PictureBoxSizeMode.StretchImage

```

```

    P1.Width = CInt(P1.Width / 1.25)
    P1.Height = CInt(P1.Height / 1.25)
End Sub
Private Function IsValidCropValues() As Boolean
    Dim objControl As Object
    For Each objControl In grpCropping.Controls
        If objControl.GetType.ToString =
            "System.Windows.Forms.TextBox" Then
            Dim txt As TextBox = CType(objControl, TextBox)
            Dim ValidationMsg As String = _
                txt.Tag.ToString & " must be a positive integer"

            With txt
                If .Name = "txtXCoord" Or .Name =
                    "txtYCoord" Then
                    ValidationMsg &= " or zero."
                Else
                    ValidationMsg &= "."
                End If
            End With
        End If
    End For
End Function

```

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```

If .Text.Trim = "" Then

    MessageBox.Show(ValidationMsg,
    Me.Text, _
    MessageBoxButtons.OK, _
    MessageBoxIcon.Error)
    .SelectAll()
    .Focus()
    Return False
End If
If Not IsNumeric(.Text.Trim) Then

    MessageBox.Show(ValidationMsg,
    Me.Text, _
    MessageBoxButtons.OK, _
    MessageBoxIcon.Error)
    .SelectAll()
    .Focus()
    Return False
Else
Try
intVal = CInt(.Text.Trim)
If txt.Name = "txtXCoord" Or txt.Name =
"txtYCoord" Then
    If intVal < 0 Then

```

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```

        .SelectAll()
        .Focus()
        Return False
    End Try
End If
End With
End If
Next
Return True
End Function
Private Sub SizeModeRadioButtons_CheckedChanged(ByVal
sender As Object, ByVal e As System.EventArgs) Handles
optAutoSize.CheckedChanged,
optCenterImage.CheckedChanged,
optNormal.CheckedChanged,
optStretchImage.CheckedChanged
    Dim opt As RadioButton = CType(sender, RadioButton)
    Dim sm As PictureBoxSizeMode = CType(opt.Tag,
        PictureBoxSizeMode)
    If opt.Checked Then
        P1.SizeMode = sm
        If sm = PictureBoxSizeMode.AutoSize Then
            cmdFit.Enabled = False
        Else
            cmdFit.Enabled = True

```

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```

        MessageBox.Show(ValidationMsg,
        Me.Text, _
        MessageBoxButtons.OK, _
        MessageBoxIcon.Error)
        .SelectAll()
        .Focus()
        Return False
    End If
    ElseIf intVal <= 0 Then

        MessageBox.Show(ValidationMsg,
        Me.Text, _

        MessageBoxButtons.OK, _
        MessageBoxIcon.Error)
        .SelectAll()
        .Focus()
        Return False
    End If
Catch Exp As Exception
    MessageBox.Show("Value must be a
    positive " & _

    "integer.", Me.Text,
    MessageBoxButtons.OK, _
    MessageBoxIcon.Error)

```

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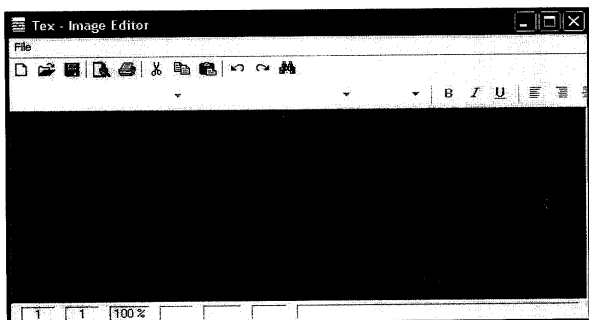
```

        P1.Width = PICTUREBOX_WIDTH
        P1.Height = PICTUREBOX_HEIGHT
    End If
End If
End Sub

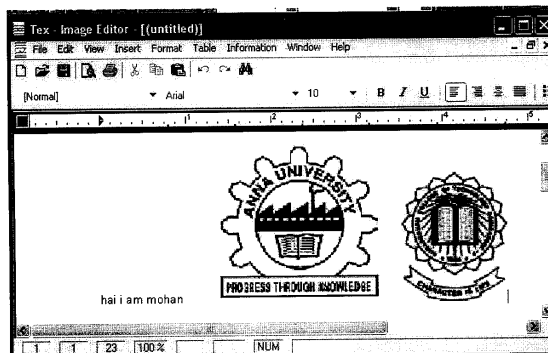
```

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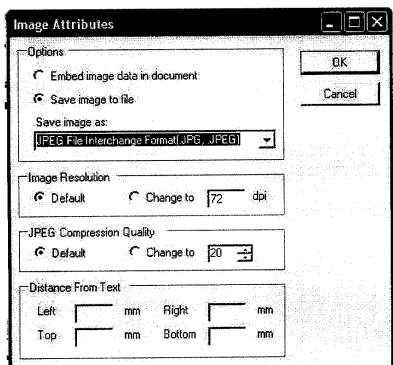
1. START – UP SCREEN



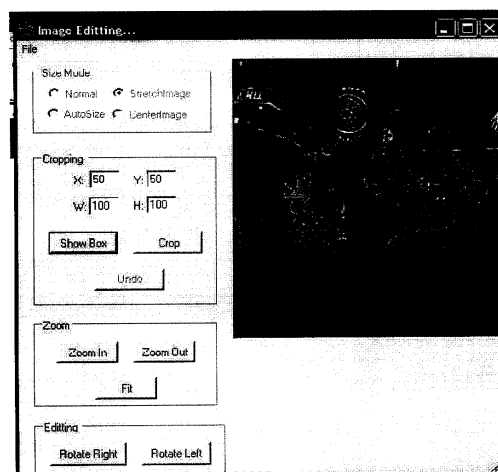
2. CHILD WINDOW



3. SAVING THE IMAGE IN THE SEPARATE FILE

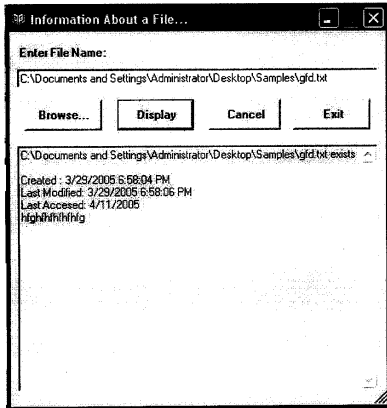


4. IMAGE - EDITING



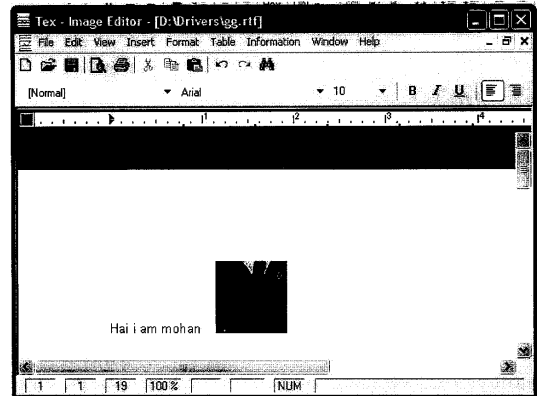


## 5. TO VIEW THE INFORMATION ABOUT THE FILE



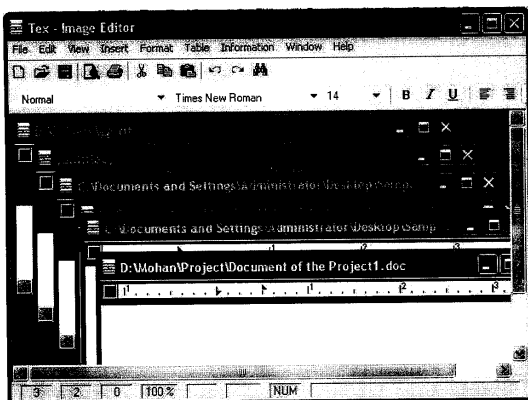
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## 6. SAVING BOTH TEXT AND PICTURE IN THE FILE



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## 7. CASCADED WINDOW



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## 10. REFERENCES.

1. Andrew Troelsen, 'Visual Basic .NET and the .NET Platform : An Advanced Guide', 2001.
2. Charles Petzold, 'Programming Microsoft Windows with Microsoft Visual Basic .NET', Microsoft Press, 2002.
3. David S. Platt, 'Introducing Microsoft .NET', third edition, Microsoft Press, 2003
4. Francesco Balena, 'Programming Microsoft Visual Basic .NET', Microsoft Press, 2002.
5. Michael Halvorson, 'Microsoft Visual Basic .NET Step by Step – Version 2003', Microsoft Press, 2003.

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