International Journal of Enhanced Research in Science Technology & Engineering, ISSN: 2319-7463
Vol. 3 Issue 4, April-2014, pp: (33-38), Impact Factor: 1.252, Available online at: www.erpublications.com

Effect of Creating Dll Libraries in Software Reusable Components

Sedeeq Hassn Albana Ali Al-Khazraji
Asst. Lecturer, College of Computer Science and Mathematics, University of Mosul, Iraq

Abstract: Reusing software components is considered as one of the new concepts in software engineering, because it reduces lots of time, efforts and costs in achieving programming projects. This concept is not only particularized to a certain programming language but also can be used in all programming languages, particularly those support creating the programming libraries. In the current study a (DLL) was established by means of C# language depending on an open source software which works on recognition human facial expression and studying the impact or reusing the DLL in the new project for the sake of knowing the importance of establishing the DLL in reusing programming components.

Keywords: DLL, Reusing components, C#, Software Engineering.

1- The DLL

It is defined as (dynamic link library) a library that contains a group of software instruction and data which can be used by more than one program at the same time. By using DLL any program can be divided into separate units each one can be uploaded to the main program during operating time if that unit was installed. With the existence of separate units the time of uploading to the main program during operating time will be faster and one single unit will be uploaded when (it is called) to fulfill its own duty the matter which results in less usage of computer resource. (1) 1-1 Steps of establishing a DLL: A DLL relies on (Windows) systems; therefore it is possible to program it by any of (Visual Studio) languages such as C#.NET and Visual Basic.NET. The DLL will contain a group of (Classes) and a group of (Methods) and data, and constituted and used through the following steps by means of C#.NET: (1)

1. Create a new class library project
2. Create classes
3. Write code
4. compile Project
5. DLL Created
6. Create a new project
7. Add Reference
8. Navigate to the class library folder
9. Go into the debug folder or whatever and include

2- Reusing Software

Reusing software is a process of establishing a programming systems from previous programs which were constructed instead of constructing new complete programming systems. It is also considered as one of the strongest methods of modern software engineering (2). Reusing programs is done by collecting and altering parts that can operate interchangeably (interoperable parts), then the new component will be reused in many applications the matter which allows to develop the fastest applications with reduction in cost and with high quality. (3-4)

2-1 Reuse Software Types:

Reuse software is divided into two divisions:

- Reuse without change: usually it is done by choosing a component from a database of a particular program and use it in new programs which are under development. But in this type there are many challenges in the appropriateness of the new application the matter which makes reusing the existing components, without change, a very hard choice.
- Reuse with change: change in software which are wanted to be reused, is due to many reasons amongst are:

1. Difference in function
2. Difference in the language of programming
3. Different from the target environment or the operating environment.

Reusing software (with change) is also a very hard task because it may take great efforts in specifying the parts of the components that need changes. Also changes should be checked to know its appropriateness with the requirements of the new system. (5)

3- Reuse software quality measurement

Pressman identified a group of reuse software quality measurement as follows: (6)

1. Reuse of software should be effective in decreasing the cost of the final system.
2. Should be effective in decreasing the time to achieve the system.
3. The final system should be subject to be used by others.

4- Related works

1. The researchers Crokovic, Stig Larsson and Michel Chaudron made a comparative study in 2005 for the systems which are based on the concept of reusing software and other systems which are not based on this concept. They also identified some regulations in knowing the capability of reusing the programming components. (7)

2. The researcher Peter D. Mosses made, in 2008, a descriptive study on (Based components) in some programming languages and the importance of reuse software and the existence of some tools that are used to support the job of programming languages. He also used some mathematical methods such as Formal Method in to recognize the based components in the programming languages (8).

3. The two researchers S.S. V.N. Sharma and P. Shireesha build, in 2010 a system based on reuse of programming components to check the improvement of the programming code of ABAP language, which is a language specialized in applying the advanced works. They also identified how to construct an element can be reused and how this element is used ideally then recognition the principles and standards that are related to this concept (9).

4. The two researchers Dinesh Ch. Jain and Mamta Gupta made, in 2012, an experimental study for the activity of reuse software by the designer who are experts in the field of designing directed programming and the reaction among some designing processes such as representing the problem and searching for it and evaluating solutions. Also a new scenario was proposed for reuse software (10).

5- Describing the proposed DLL

The proposed DLL is summarized in transforming a large programming project, which was programmed by C#.NET language. This project consists of a group of namespaces that contains a large group of classes containing a large group of Methods by which thousands of programming lines are formed. The programming project will be reused in creating the proposed DLL which itself will be reused in any other project in the future.

6- The accredited programming project

A huge number of open resource programs are available for all programming languages on many webs the most important of which are (Source Forge and Code Project). Since the proposed DLL will be programmed by C#.NET language, so a programming project which was translated by the same language, should be accredited. After searching for a useful programming project; facial identification project by C#.NET language was chosen from Code Project web (11). This project is based on recognition human face through applying some algorithms of recognition human face. This project was chosen for the following reasons:

1. The project consists of a large number of lines and methods which will clarify the importance of reusing software concept.
2. The unavailability of a DLL in C# language that recognize human face, therefore the resulting DLL will be very useful the specialists in the field of treating photos and recognition types because their work is restricted to the libraries with Matlab language.

6-1 the constituents of the accredited programming project:

The programming project is based on recognition human face and recognize the human feelings of the face such as smile and sadness. It depends on recognition the color of the skin in the photo then it recognize the face after that it separates the eyes and the lips then recognition Bezier curve for the eyes and the lips after that it makes a comparison between the values of Bezier curve with the values that have been already saved in the database of photos of some persons, then it finds the nearest value of the curve for the sake of recognition the face of the person and facial expressions also.

6-2 Algorithm of creating the proposed DLL:

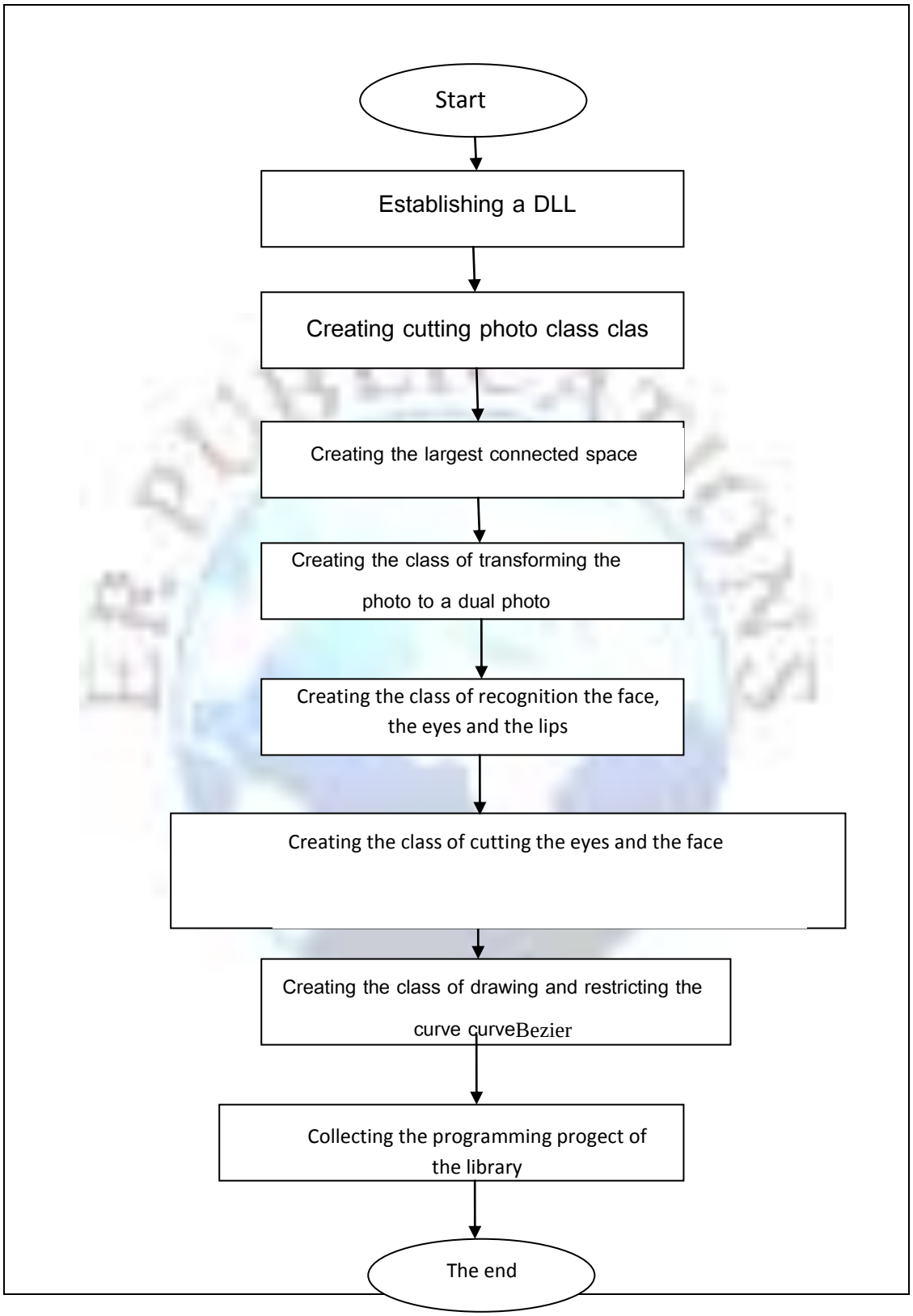
The proposed DLL was constituted by the following steps as they are shown in diagram (1):

1. Creating a new project for establishing a DLL
2. Creating the class of cutting photo and recognition the color of the skin.
3. Creating the class of restricting the largest connected space to the color of the skin in order to recognize the face.
4. Creating the class transforming the photo to a dual photo in order to facilitate the process of treating the data of the photo.
5. Creating the class of recognition the face, the eyes and the lips.
6. Creating the class of cutting eyes and lips
7. Creating the class of drawing and restricting Bezier curve of the eyes and the lips.
8. Collecting the programming project of the library and making Compile.

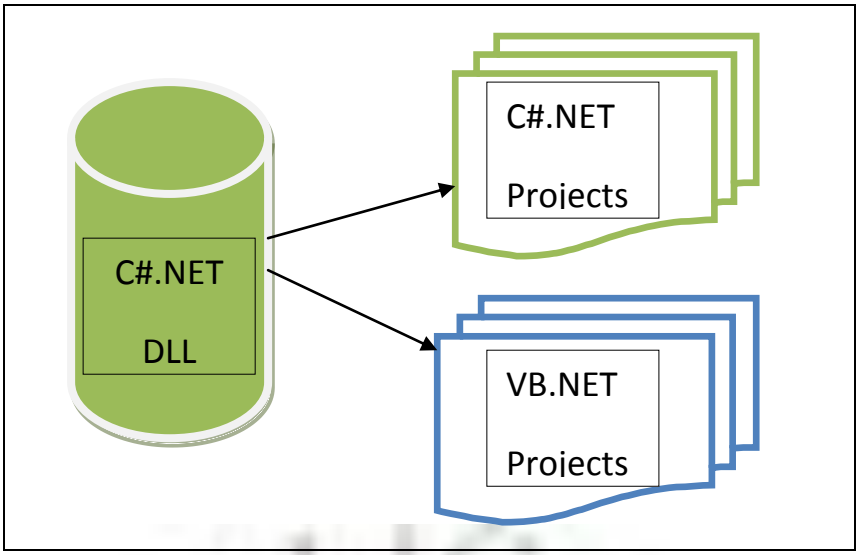
6-3 Using the proposed DLL:

The most important thing that characterizes the proposed DLL is the easiness of reusing it by the new projects, when the required class is called through a single programming line instead of using hundreds of programming lines that exist in the class and were available in the accredited programming project. And the most important feature in the proposed

DLL, which was programmed by C# language, is the capability of using it in projects of Visual Basic. Net language as it is shown in diagram (2).



The diagram of creating algorithm of the proposed DLL



The possibility of reusing the DLL in different languages projects

6-4 reusing of the programming code:

The proposed DLL is constituted of 9501 programming lines which were reused from the accredited project distributed on the arrays that are shown in table (1):

Function	Class name
Receives the picture and cuts it	skin_color_segmentation
Receives the photo and recognize the largest related area depending on the color of the skin which is already identified	Connected_area
Receives a colored photo and transforms it to a dual photo	black_white
recognize the face	Face
recognize the eyes and the lips	Eye_LIP
recognize the left eye and draws its own curve	left_eye
recognize the right eye and draws its own curve	Right_eye
recognize the lips and draws its own curve	Lip

The above mentioned classes in the previous table are called through creating an entity from them and call all the existing methods. The call process is very easy for the final user of the library because a user of the library will not be obliged to look at thousands of programming lines from which those classes are constituted the matter which accomplishes the required objective of reusing programming code concept.

6-5 measurement of quality of reusing DLL:

After establishing the proposed DLL; it was reused for establishing a new project for recognition the expressions of the face and the results were as follows:

1. Time: the project was achieved within a standard time; when only classes and methods were called from the library the matter which lead to a high speed in achieving the project within a period of time not more than two hours, but if the project was established from zero it would take days or months.
2. Effort: after using the DLL; the difference between efforts has become very clear, because the provided effort of the project is nearly nothing in comparison with the provided effort if the project is made from zero.
3. Cost: if the cost of the new project, which is based on reusing the DLL, was taken into account we would find that there is a great reduction in the cost, because cost as it is known is measured by the number of the programming lines which are written. When we compare the genuine number which the library contains, which is consisted of 9501 programming lines, with the number of the lines which is not more than 100 lines then we notice a great reduction in the cost of the new project.
4. The capability of using the DLL in any language of Visual Studio is an evident of the concept of applying reuse software.

7 - Conclusions

The following findings are reached at in this study:

1. Establishing DLLs is very important in the process of reusing software
2. Reusing of DLLs reduces time, cost and effort in programming new projects
3. It is possible to reuse DLLs which are programmed by C# language with new projects in Visual Basic. NET and C#. NET languages.

8- Recommendations

The most important recommendations for the development of reusing software process are:

1. Transforming all large open resource projects to DLLs to facilitate reusing them by programming developers.
2. Studying the problems of reusing DLLs in programming projects.

References

[1]. 1-John Sharp , (2010), "Microsoft Visual C# 2012 Step by Step" , O'Reilly Media, Inc. , United States of America.
[2]. CHARLES W. KRUEGER, (1992), "Software Reuse ", ACM Computing Surveys, Vol. 24, No. 2 , USA.
[3]. Arun Sharma, Rajesh Kumar & P S Grover , (2008), "Managing Component-Based Systems With Reusable Components ", International Journal of Computer Science and Security, Volume 1 : Issue (2).
[4]. Arun Sharma,(2007) Rajesh Kumar, P S Grover, "Few Useful Considerations for Maintaining Software Components and Component-Based Systems", ACM SIGSOFT Software Engineering Notes, Vol. 32, Issue 4, September.
[5]. Won Kim, (2005) "On Issues with Component-Based Software Reuse", in Journal of Object Technology, vol. 4, no. 7, pp. 45-50.
[6]. Roger S. Pressman, (2010), "Software Engineering Practitioner's Approach" 7th edition ,USA.
[7]. Ivica Crnkovic, Stig Larsson, Michel Chaudron, (2005)," Component-based Development Process and Component Lifecycle ", Information Technology Interfaces, 2005. 27th International Conference.
[8]. Peter D. Mosses, (2008) , " Component-Based Description of Programming Languages", BCS International Academic Conference 2008 – Visions of Computer Science.
[9]. P.Shireesha, Dr.S.S.V.N. Sharma, (2010) , "Building Reusable Software Component For Optimization Check in ABAP Coding", International Journal of Software Engineering & Applications (IJSEA), Vol.1, No.3.
[10]. Ms. Mamta Gupta , Prof. Dinesh Ch. Jain, (2012), " An Emerging Scenario for Reusability of Software in Software Engineering ", International Journal of Advanced Research in Computer Science and Software Engineering.
[11]. http://www.codeproject.com/Articles/110805/Human-Emotion-Detection-from-Image.