GRADUATION PROJECT

DATA-TRANSFER SYSTEM

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The title page lists all kinds of information necessary for Administration and Documentation, such as your student number, and the name and address of your internship company.

GRADUATION / INTERNSHIP REPORT

FONTYS UNIVERSITY OF APPLIED SCIENCES

HBO-ICT: English Stream

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Student number:	**2133628**
project period: (from – till)	**Sep,2013 ---Jan, 2014**
Data company:	
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Final report:	
Title:	**Graduation project**
Date:	**8th Jan, 2014**

Approved and signed by the company tutor:

Date:

Signature:

Preface

In the past two decades, the thermal and electromagnetic analysis software and simulation software have been used in a significant number of the increasing popularity of Chinese high-tech enterprises. Fortunately, as a junior programmer I can participate in this project which helps me to understand and learn the knowledge of this area.

This essay will be given a comprehensive overview of the work of my six-month internship. First of all, I will introduce my company and the software of thermal and electromagnetic areas. Then I will share each significant aspect of coding the program, which including like interface design and problems solving etc. After that I will some research data and essay of simulation software which will tell the future of this area. After all, I am going to share my personal evaluation of my graduation project.

Frankly speaking, this project has a considerable challenge for me. There are two parts of pressure on me; one is that I have to finish my college study with project, another one is I would like to give my company supervisor a perfect program when I finish my final internship. Therefore, I consider it was a great experience to work at the Tianyuan technology corporation Ltd.

ACKNOWLDEGMENT

I wish to express deep sense of gratitude to Mr. Zijlmans, my director of graduation project, who provided me his valuable supervision and helpful suggestions in the completion of this report.

And I am thankful to my company supervisors Dr. Zhang and Ms. Sun who provided me this opportunity to achieve the practical experience.

Table of content

Chapter 1: Introduction

My name is Jue Wang. Now I'm a fourth-year student who studying in Fontys University. In this semester, I was working in Tianyuan technology corporation Ltd. for my graduation project. My position was junior programmer in our team. In this project group, I was involved in user interface designing, database building and coding of this program. The program was named DataTransfer system. Considering the purpose of this project and future development of the program, I decided to build the MFC (Microsoft Foundation Classes) single document architecture. In addition, I was using ODBC (Open Database Connectivity) of CdataTransferApp to connect with Access, and built a single form database since this program is single document architecture. This project has a couple of functions; firstly the program can extract BMP, DAT, CAD and AVI files. Then the program could display BMP and DAT files in the same window in order to contrast data between BMP and DAT files. After that, the user can delete any file packet in the user interface; additionally the user can view the detail of data from the database at the same time. However, my program only can be ran with x86 system since the CadLib only have the version of Win32 (Finding more information in Chapter 4). Furthermore, my company supervisor told me that they would like to do some test on the thermal prediction and electromagnetic analysis simulation software with this program. However, it has to be tested and evaluated after I finished my graduation project.

Hereby I will briefly explain about the chapters of my report. Firstly, you may find some the company information and current products in the Chapter 2. I believe that you can preliminary understanding the business of my company. And then in the Chapter 3, I will specifically expound about my graduation project. You may find some details of my works in this chapter. After that, it is the Chapter 4 of research which is how to extracted DXF file with Microsoft Visual C++. Then the chapter 5 will tell you some details about the system design which identified problems and objectives as well as analyzed the system needs. And you may get some information about designing of the system in the chapter 6. Furthermore, you may read some testing information in the chapter 7. The chapter 8 is the system evaluation which including the evaluation of my company supervisor and I for the system. And the last chapter is the conclusion of report.

Chapter 2: About the Company

2.1 The introduction of company

The Beijing TianYuan Technology Corporation Ltd. (TianYuan Tech) has been founded more than a decade by Mr. Du (Xinfu Du). The company mainly operating on offering software and all-in-one services in thermal and electromagnetic analysis areas. Additionally, the TianYuan Tech also offers a number of peripheral businesses which including design, prototyping and testing, etc.

2.2 The promoting products

Currently, the TianYuan Tech has more than ten kinds of advanced software products. Hereby I will briefly introduce several key products.

> *The 6SigmaDC is an integrated thermal prediction tool and solver (See Figure 1: Cabinet and Server Internals), which will work for datacenter operators, datacenter designers, facilities managers, field engineers and equipment designers. It contains all the tools necessary to create your perfect Virtual Facility[1].*
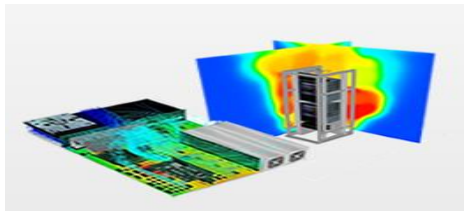

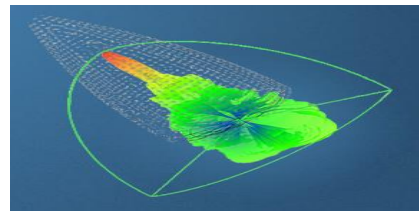Figure 1: Cabinet and Server Internals

Figure 2: NewFasant

> *The NewFasant is electrically large electromagnetic problem simulation software (See Figure 2: NewFasant), which provides solutions for the defense and civil scopes: Naval, Aerospace and Automotive Industries, analysis of Antenna and RF components, and many more[2].*
> *SEMCAD X is the most advanced 3D full-wave electromagnetic and thermal simulation platform (See Figure 3: SEMCAD X) based on the FDTD[3], FEM, and Mode-Matching methods. A large range of design applications are suitable this system, such as for*

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[1] Future facilities: http://www.futurefacilities.com/software/6SigmaDCOverview.php
[2] New Fasant: http://www.fasant.com/en/products.php
[3] Wikipedia: http://en.wikipedia.org/wiki/Finite-difference_time-domain_method

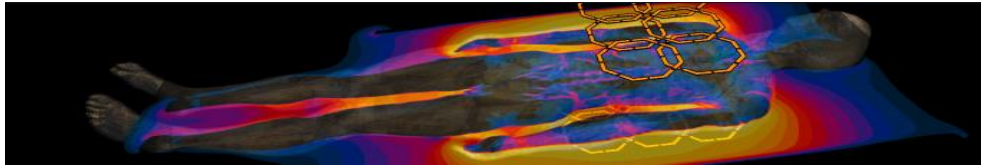*medical implant devices, MRI coils and antennae[4].*

Figure 3:   SEMCAD X

2.3 The cooperative enterprise

The TianYuan Tech has established strong long-term relationships with the customers in variety fields such as automotive, medical, telecommunications, engineering, power and aerospace. There are two major categories of clients are commercial customers and government companies respectively. For instance, Huawei, HP, IBM and Samsung Electronics etc (see Figure 4, 5, 6). are my company long-term commercial customers. Additionally, the TianYuan Tech also supplies services to some Government companies such as China Academy of Launch Vehicle Technology (CALT), Chinese Academy of Science and Lenovo etc. The company adhering to the driver the ability to rapidly develop and improve innovative, quality products focused on improving customer outcomes and offer technically advance, simple and cost-effective solutions.

Figure 4: Huawei   Figure 5: HP   Figure 6: Samsung

2.4 The company's development prospects

The company plans to continue to expand the scope of their sales in next five years. In addition to the company headquarters in Beijing, and now there are several offices located in major cities in China. Moreover, the chairman of TianYuan Tech told me that he would like to set up offices overseas in order to do business with foreign clients. More importantly, the company extremely eager some talent can help them to write some of their own programs to support existing software. In other words, they hope to create a new department to undertake this part of work after I finished my graduation project. Therefore, I feel that this six-month internship is very rewarding since my programs more or less help the company solve some problems.

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[4] Speag: http://www.speag.com/products/semcad/overview/

Chapter 3: Assignment Overview

3.1 The current situation

This company is operating more than ten kinds of software from different countries. However, some of the software needs to be improved since there are a lot of Chinese customers made various requirements. My company has been lack of manpower in program development for a long time until I came to work on this intern position. Now the current situation is that there is radar analysis software have to be inputted data manually, and leader wants to improve it recently; hence I need to make a program can input data from database automatically. However, this is a totally fresh project until I take over it. Therefore, I need to make a new user interface and build a database from 0% of this project. Moreover, I have barely help from others since now I am the only intern on this position.

In conclusion, my formal client is my technical supervisor of my company since he is responsible for developing new utility. All stages of work of this project are evaluated by him, and he gave me instructions and feedback after I finished one part of this project. Therefore, if my program can be used on the radar software in the future depends entirely on his assessment. What's more, more or less I was suffering from obsession that I need accomplished this project independently; since I used to carry out the job as a team in school. However, I believe this is a great opportunity to improve my experience of program. In addition, there were several bottlenecks plaguing me when this project began. Firstly, I need to design a fresh user interface for this program. Therefore, I need to consider that how many functions should be in this program. After that, I need to deliberate which kind of database is suit for this project. The third point is that I need to think about which coding language that I should to use on this project since this program may be used on the other as a plug-in-unit in the future. In this project, I have decided to begin programming after I had the exact decision on these issues.

3.2 The details of user interface, language and database

3.2.1 The user interface and coding languages

In the beginning of design of the user interface, I considered that the user interface of this program should be made like Microsoft Office since it mainly for the Chinese using. It should be emphasized that the Chinese are used to use Office since it has entered the Chinese market about 20 years. I still remember that the first time I used Word 95 in my primary school. Therefore, I believe the Chinese younger than 50 years old ought to know Office user interface well. Then I decided to build MFC[5] (Microsoft Foundation Class) single document architecture program with startup window maximized (see Figure7: The user interface). The MFC is actually provided by Microsoft for writing applications in C + + environment under a framework and engine. In addition, there are several other reasons why I chose the MFC. Firstly, my company supervisor knows MFC very well hence it is his recommendation. Secondly, MFC main advantage is that I can use an object-oriented way to call Windows API, and application development easy. MFC will develop in many applications automate commonly used functions, and provides a view of the document structure and activities of the framework document to facilitate such

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[5] Wikipedia: http://en.wikipedia.org/wiki/Microsoft_Foundation_Class_Library

self-defined application framework. Last but not the least, using MFC can be more convenient to maintain and optimize in the future. In conclusion, I used MFC to make the user interface more or less looks like Microsoft Office.
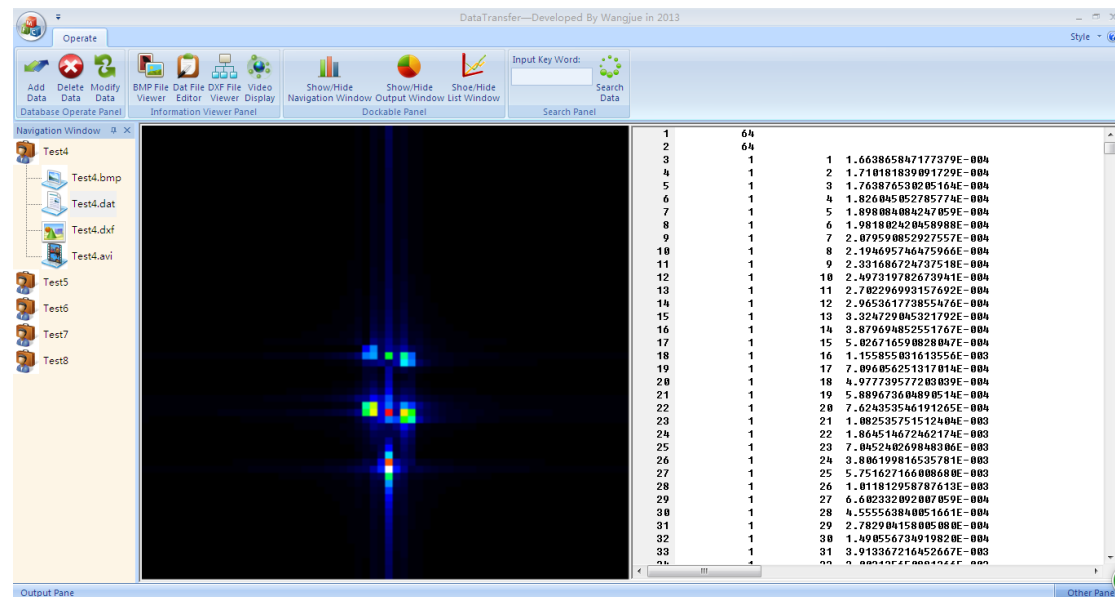

Figure 7:   The user interface

3.2.2 The database

Actually I considered the details of database at the same time with the design of user interface. There are several points that I need to concern for the database. First of all, I need to choose a totally free database since this project has just begun and the company don't have any budget for it. Then the database should be a single form database since the program is single-file architecture. Therefore, I don't need big database software like Oracle. The last point is that the database should be used convenient and easy, consequently I chose the Microsoft Access. The features of Microsoft Access are very easy to use, and it is considerable fast in such small case. Furthermore, In CDataTransferApp the Access database using ODBC connected database, and the file transfer support with the program folder.
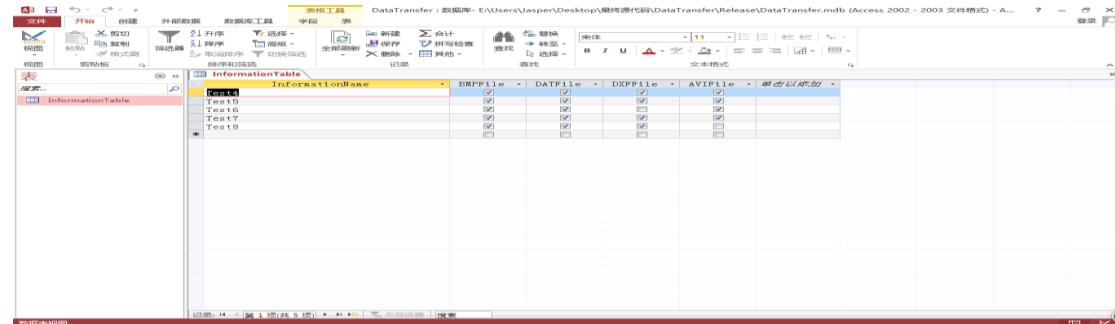

Figure 8:   The database

3.3 The deliverable of project (MoSCOW)

In this project, I need to deliver a program which has a user interface (with functions) which can connect to the databases. My initial plan is that make several basic functions such as add, delete and edit data. In addition, the BMP images, DAT files, CAD images and AVI video which can be viewed in this program. Additionally, I will use Access to make a database for this program, which will save data for this program. I don't need to deliver manual or course for this project.

Also worth mentioning is that there are several modification in the MSCOW of project plan since we had a couple of meeting for improving this program. But I can guarantee is that all of the changes are optimized modifications, which of cause are permitted by my supervisor as well as my client.

Must:

➢ *The user interface can be added data; deleted data, viewed BMP/DAT files.*
➢ *To build a database with Microsoft Access, which has single form can save data of this program.*
➢ *The program has a navigation bar in the user interface.*
➢ *The user can edit DAT file and view BMP image in the same window.*

Should:

➢ *The user interface can show any two different types of file in one window at the same time.*
➢ *To load the files from local computer.*
➢ *The navigation bar can be double clicked to show the files.*
➢ *The navigation bar can show the four types files respectively.*

Could:

➢ *To make a function of data search which including search data type and key word.*
➢ *The user interface could show the real-time data from the database.*

Won't:

➢ *I won't make other version for Linux and IOS.*
➢ *I won't integrate my program to other software.*

3.4 The remained problems

Frankly speaking, there are still some problems with my program. However, these problems are not in the software running. For instance, the biggest problem is that my program only can be ran with x86 system since the CadLib (Finding more information in the Chapter 4) only have the version of Win 32, which means my program can be ran normally with x64 system except for showing DXF files. Furthermore, now my program is single file architecture with single form database; hence, there is issue if the software needs to be upgraded to the multi-file import architecture. Moreover, I have not tested if my program can integrate on other software since this project is lack of time in the half-year. I am very curious about the integration since it is an achievement if my program could be used on some big software.

Additionally, the current version of my program is full English edition since I need to display

it to my teachers. In order to make the program more suitable for Chinese people to use, I will add the Chinese version in the near future. Of cause I will add more languages if it is necessary.

3.5 The risks of project

As I have mentioned in the project plan, I won't take any risk in this project since this project is commissioning in my company. On the company side, I think they only need to take some risk on me if I could not finish my job. However, it won't affect the normal operation of the company. Therefore, I can feel free to work on this project.

Chapter 4: Research

Figure 9:   DXF

4.1 Introduction

I have encountered many difficulties in this project; however, the most troubling issue is that I need to extracted DXF (See Figure 9: DXF) files with VC++. I have never studied the relevant knowledge of DXF during four years study in the school. Thence I decided to learn relevant knowledge in a short-time.

Fortunately, I found some advantageous materials which including Chinese and English essays. Then I made a simple plan for this subject study. First of all, I need to know what DXF is. After that, I need to know whether the DXF files can be demonstrated under VC++. After all, I need to find a way to extracted DXF files in my program.

4.2 About DXF

DXF is an open vector data format that can be divided into two types: ASCII format and binary format[6]; the readability of ASCII is good, but it need a larger space; the binary format occupies a smaller space, which has highly reading speed. Due to the AutoCAD is the most popular cad system hence DXF is also widely used, which becomes the standard for data exchange. The vast majority of CAD systems can be read or output DXF files. The CadLib uses ASCII DXF format since the ASCII DXF files are more common than the binary format.

4.3 About CadLib

The CadLib was created as a powerful and reliable .NET library that can help you view, import and export AutoCAD files. The Dynamic Link Library (For creating the DXF file) and the programming interface are the component parts of CadLib. It is a class that integrates the cadio.dll functions, which can be used in Microsoft Visual C++ projects[7]. In addition, it is only have the version of

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[6] AutoCAD, WIKIPEDIA, 2012 http://en.wikipedia.org/wiki/AutoCAD_DXF

[7] CadLib for creating DXF file, 2004 http://www.codeproject.com/Articles/3398/CadLib-for-creating-DXF-Drawing-Interchange-Format

Win32 which means it only can be ran on 32-bit (x86) system.

4.4 The reason of using CadLib

Generally, there are plenty of programs need to create a drawing output such as "radar analysis system" and "Industrial simulation program". The DXF file is the most standard format for communicating drawing data. Therefore, some specific programs need to output graphics files which can be used AutoCAD and other programs.

4.5 DXF file structure

DXF file format is a graphical file tag data description of all information. Tagged data is each data element in the file which is preceded by an integer number that is called a group code. The value of group code indicates the data type of the following data and the meaning of the data unit. The actual graphics files of all user-specific information can be described as a DXF format.

A DXF file has several sections. Each section consists of some graphics data in itself (See Figure 10: DXF data interface flow). The CadLib uses the following sections:

1. *HEADER*

   The header section recorded the current values or the current state of all variables in the table body of AutoCAD system. These tables record the current body of work environment variables of AutoCAD system. For example, AutoCAD version number, insert basis, drawing boundaries, capturing the current state of SNAP, the grid spacing, style, name of the current layer, the current line and the current color etc.;

2. *TABLES*

   The table section contains four tables; each table also contains a variable number of entries. According to the order, these tables appear in the file; they are linear form, graphic form, the word table and view tables respectively;

3. *BLOCKS*

   The block section recorded and definite each block name, the name of current layer, all blocks type, the insertion base point of block and the composition of block. The types of block are graphical blocks, anonymous blocks and the blocks with attributes. The anonymous block generated by HATCH command and command completion with DIM dimension.

4. *ENTITIES*

The entity secation recorded each collection name of entity section, the current layer name, the line name, the color number, the height of base level, the thickness of base level, and all of geometric parameters.

5. *OBJECTS*

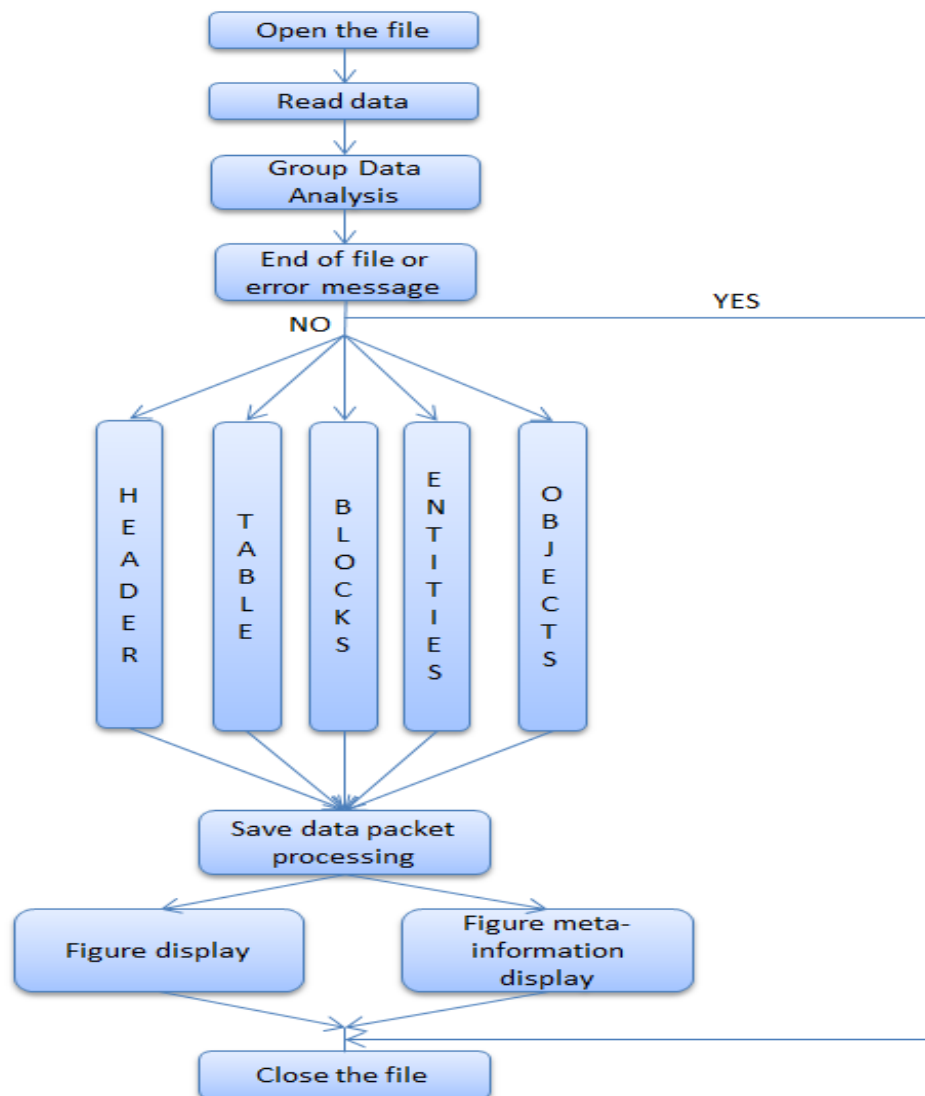*The object section is using for non-graphic objects.*

Figure 10:   DXF data interface flow

Chapter 5: System Analysis

5.1 Identifying problems and objectives

The Tianyuan Tech has been operating for thermal analysis software and simulation platform more than a decade. They fully understand this industry trend hence my company's supervisor wants to improve the department of independent research and development. However, they almost never been carried out to develop their own programs precedent. Therefore, my graduation project is a pilot project in my company.

The current problem is that the company has radar analysis software need to be improved with the data importing and data viewing. My supervisor told me that now this software has some defects such as import data slow, viewing BMP and DAT files separately and the lack of a dedicated database support. Therefore, he wants to make an independent program which has fire-new user interface with a dedicated database.

Therefor I have several objectives in this half-year long work. In the first place, I need to make a program has independent user interface and database with a couple of basic functions. Secondly, at least this program can operate all of functions independently. The third thing is that to test this program comprehensively with my company supervisor. The last but not least, testing my program whether is able to run with other software if I have enough time.

5.2 Analyzing system needs

After listening to him expound on this project, I have several ideas for this program. First of all, I can make the user interface with MFC since my supervisor knows it very well. Additionally, I want to make the user interface more or less looks like the Microsoft's software such as Office, Windows, VC and VS in order to more suitable for 70's and 80's Chinese user[8]. I believe that software is good and bad depends on whether its user interface is easy to use when the user first time uses it. In other words, the most important thing to develop program is that user friendly. Secondly, I think this program doesn't need a big database since all of data can be imported from the local computer. Therefore, I need to choose a lightweight and efficient database from a large number of database platforms. The Oracle is my first option to exclude since it mainly works for large-scale software or company. It is a one of good choices for data warehousing. Naturally the DB2 is oversize for this project as well as SQL server. Then I have to make a choice between MySQL and Microsoft Access. Frankly, personally I prefer to use Access since its user interface more user friendly. Another reason is that the database size of Access smaller than 100M that the transferring speed is pretty good[9]. Furthermore, the original concept of Access was for end users to be able to "access" data from any source. Another feature is that the import and export of data to many formats including Excel, Outlook, ASCII, SQL Server, Oracle and ODBC, etc[10]. It also

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[8] ZOL 2013 http://server.zol.com.cn/371/3717686_all.html

[9] Baidu http://baike.baidu.com/link?url=ZTpICURS93mQqM0NdGqzXj_zDR-2-hQdyWp9iBTtRJz-QNObqT3CBs71a9eDNZOj2hG65hOcw3EXYzpSmX0egK

[10] Wikipedia 2014 http://en.wikipedia.org/wiki/Microsoft_Access

has the ability to link to data in its existing location and use it for viewing, querying, editing, and reporting. This allows the existing data to change while ensuring that Access uses the latest data. It can perform heterogeneous joins between data sets stored across different platforms. Therefor I decided to use Access on this project.

Chapter 6: System Design

6.1 The User interface design

To begin with, I had a short meeting with my supervisor to talk about the function details of this project before I designed the user interface. We generally determine a few basic functions such as add files, delete files, view files and file searching etc. Furthermore, the user interface should has four parts of frame which are the operating panel (See Figure 12: The new operating panel), the navigation bar (See Figure 14: The new navigation bar), the document display window (Figure13: The document's display window) and the data output window (See Figure 16: The output window and The database list window). Then I decided to make the user interface of my program like the Microsoft Office Word 2013 since most Chinese user are very adapt to this user interface style.

6.1.1 The operating panel

According to the developing plan, I think the user interface should has four panels on the main window which are database operate panel, information viewer panel, dock-able control panel and search panel respectively. Firstly, the database operate panel should has three buttons which are add data, delete data and modify data. After that, the information viewer panel should has four buttons since the program can display four different format files. Hence this panel including BMP viewer button, DAT viewer button, DXF viewer button and AVI (video) button (User also can double-click node on the navigation bar to open the specified file.). Moreover, the dock-able control panel has three button which are show/hide navigation window, show/hide output window and show/hide list window. In addition, I made a search panel which user can locate the target file quickly and accurately. A mentionable thing that there were two versions of the operating panel. The old operating panel (See Figure 11: The old operating panel) is divided into three parts so that user can't see all functions. Then I made some improvements for the operating panel. Firstly, I putted all the buttons in the same interface so that all functions will be at a glance (See Figure 12: The new operating panel). Then I placed the search panel to the back of rearmost operating panel. I think the looks of new operating panel is much better than the old one after made some modifications.
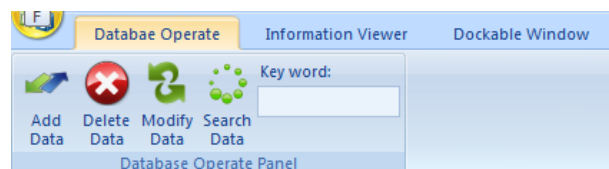

Figure11:   The old operating panel
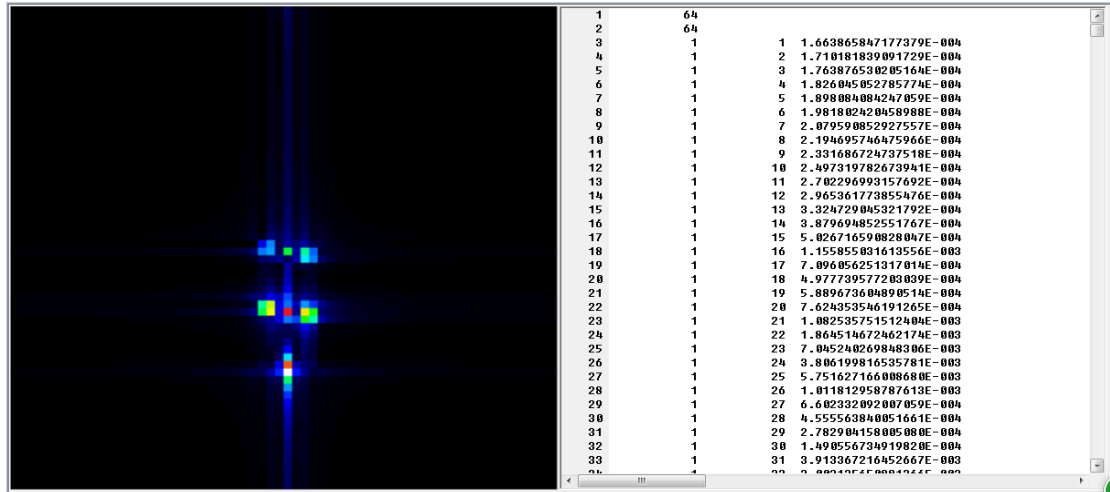
Figure12:   The new operating panel

Figure 13:   The document's display window
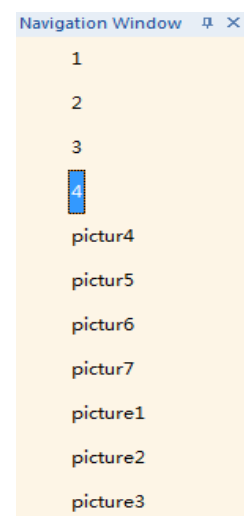

Figure 14: The new navigation bar
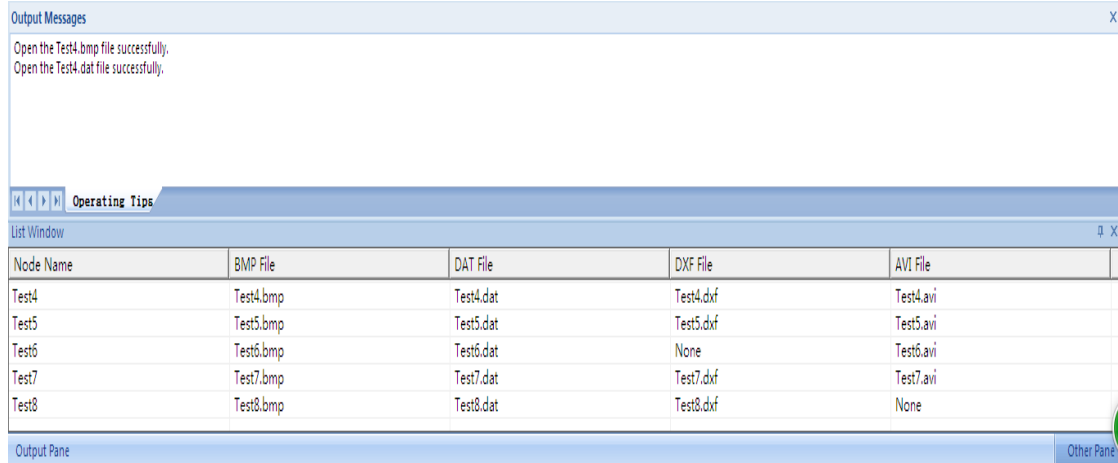

Figure 15: The old navegation bar

Figure 16: The output window and The database list window

6.1.2 The document's display window

I remember my supervisor told me that users can not open BMP and DAT files in the same window. It will waste a lot of time to open it one by one. Therefore, I made a split-screen window (See Figure 13: The document's display window) for displaying two different types file simultaneously. On the one hand, the users can improve efficiency when using this program since the split-screen window can contrast two various documents at the same time. On the other hand, it will makes the user interface looks more professional. In addition, I added "Save" function in this window in order to the users can save the modification of DAT file any time. The program will pop up a box to confirm that the users want to save changes in the DAT file when opening another DAT file (See Figure 17: Saving changes of DAT).
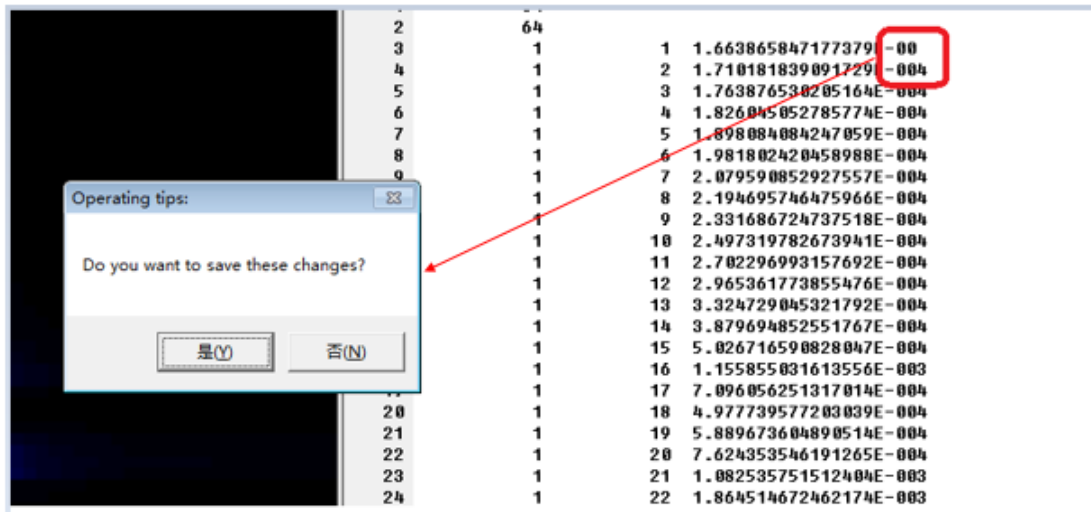

Figure 17: Saving changes of DAT

6.1.3 The navigation bar

I just made a very simple navigation bar (See Figure 15: The old navigation bar) in the beginning

of the project. The nodes only have a file name, and user needs to click singly the information viewer panel buttons to display various documents. Now the current version of navigation bar not only has figures and extensions, but also user can double click nodes to open files.

6.1.4 The output window and database list window

The output window will shows the status of loading files. The user can view the log of program at here. Additionally, the data of database will be shown in the database list window. All of showing data are real-time data that user can view the details of database in the user interface. The system will shows "none" in the form if there is no specified file in the database (See Figure 16: The output window and The database list window).

6.1.5 User friendly

Here I need to emphasize that I considered that the main window of the program must have many docking bars or windows. Therefore, I made this dock-able control panel for user can freely adjust the user interface (show or hide/ docking or not docking). Additionally, I used four different pictures and extensions in the navigation bar that users can more easily distinguish various types of files (See Figure 14: The new navigation bar). I believe this small detail more or less reflects user-friendly in my program.

6.2 The Database design

In the beginning of the design of the database, firstly I considered that all of files are extracted from the local computer. And the program is single document architecture which means one data packet included four different files (BMP, DAT, DXF and AVI). Therefore, the database should only have one table. And the form contain five columns which are the file name (It is the data packet name which named by user), BMP file, DAT file, DXF file and AVI file (See Figure 18: Information table). The file name will be the default name of data within the data packet. However, the extension of each file on the navigation bar are different in order to allow users to easily distinguish (See Figure 14: The new navigation bar).

InformationName	BMPFile	DATFile	DXFFile	AVIFile	单击以添加
Test4	✓	✓	✓	✓	
Test5	✓	✓	✓	✓	
Test6	✓	✓	☐	✓	
Test7	✓	✓	✓	✓	
Test8	✓	✓	✓	☐	
*	☐	☐	☐	☐	

Figure 18: Information table

Chapter 7 System Testing

7.1 Separate Test

As I said before, I need to do all the testing tasks by myself due to I don't have any team mate. Therefore, the testing work was divided into several stages by me. For instance, I did a comprehensively test of the system when I finished a decent function. The advantage is that I will find some errors and defects at very first time with programming this system. This action will prevent the occurrence of errors chain in the system. Additionally, I will send the program to my supervisor after I tested the system of specific stage. He will give me some feedbacks and suggestions of modification in five working days. In the last month of my internship, I did a great number test for the system by myself since my supervisor was always busy on some business trip. However, we never stopped the communication of testing the system by e-mail. I know the importance of test since I finished my last internship. Therefor I believe that found errors in the programming process is always better than found errors after the work is completed. Moreover, I asked my friend who knows programming knowledge that tested the program personally as a user that will ensure the quality of the system. On the other hand, I will know some feedback of user's experience from a third party tester.

7.2 Collective Analysis

As I mentioned in the last paragraph, this project was tested separately many times thereby I should integrate all the feedbacks together afterward (See Figure 19: The integration of testing feedback). I gained plenty of knowledge when I contrasted the separate feedback with my personal testing log. On one hand, the integration not only can helps me to find more errors, but also it can helps me to exclude many fixed errors. On the other hand, I have improved many parts of function such as the navigation bar and the docking windows by the collective analysis.
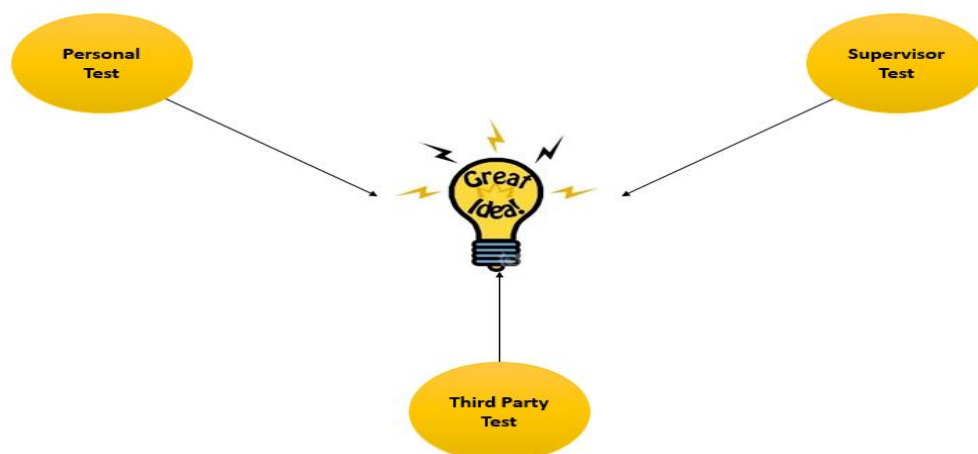

Figure 19: The integration of testing feedback

Chapter 8: System Evaluation

My supervisor and I evaluated the system together in a meeting. Overall, there are several aspects of the evaluation. First of all, I tried to complete all the expected features which you can see the MSCOW of chapter 3. The main functions such as load, view and delete files are operating correctly. Secondly, I spent a lot of time on the user interface. On one hand, a nice user interface will give users a good first impression. On the other hand, the reasonable layout of the user interface will improve the efficiency of work when users using this program. Therefore, we think the program has a decent user interface with user friendly (See 6.1.5 User friendly). The third big thing is that I made all the functions of "Should" and "Could" works correctly (See 3.3 The deliverable of project). Though the tasks are pretty tough, I managed to accomplish it on time with plenty of research online. We considered that the navigation bar and the document's display window are among the best of my work.

In addition, we have some aspects of disadvantages of this project. Firstly, this program cannot load multiple files of the same type in a packet due to the program was single file architecture. For instance, the system cannot import more than one BMP file once. In other words, users need to create a new item for the other BMP files. Secondly, the system can't load multiple files automatically which means users need to create items one by one. I considered that this will be improved together with the first problem since these problem are related to the architecture of the system. We believe that these two issues are the most important things of the system optimization in the future. It also should be discussed in detail before change the system architecture. The third thing is that the current system is only work perfectly with x86 Microsoft Windows system due to I used CadLib.dll for viewing DXF (See 4.3 About CadLib). However, the program can be operated 80% functions with x64 Microsoft Windows system after compiled the code into 64-bit by visual studio. The last but not least, I didn't make any other version such as Linux and IOS.

Objectively speaking, these issues of program are due to lack of time and manpower shortage. There are too many things that I need to accomplish by own hands. However, the result is pretty optimistic.

Chapter 9 Conclusion

In the end, the graduation project was an unforgettable experience that very helpful for my future life. My company Tianyuan Tech has given me a lot of room on this project. As I mentioned in the previous chapters that I did plenty things independently in this half year. On the one hand, I am very grateful to the school that give us the freedom to choose their place of internship. Therefore, I can adapt to the Chinese workplace environment in advance. On the other hand, I am really appreciate the company provided me with such a challenging project.

I am very memorable the process of this project due to the most of the work on this project is done by myself. Frankly, I faced a large number of problems in this project. For instance, I have several ideas for the system in the beginning of designing the system. Thus I need to decide a feasible solutions in short time since I don't have much time to program the system. I considered that the user interface should adapt to Chinese user. Then I made the user interface looks like Microsoft Office with user-friendly. I think the navigation bar and the docking windows are the best works in the user interface since it's user-friendly. Furthermore, I am very proud of the document's display window since it can display two different types of file at the same time. In addition, I made a lot of effort on displaying DXF file which I did plenty of research on it.

Moreover, there are two shortcomings in the project. Firstly, in the system architecture that I made a small mistake that it would be better if I make a multiple file architecture for this system. However, it does not affect the overall operation of the software. Another regrettable thing that the system only can operate all functions correctly on 32-bit system (x86 system) since the CadLib only have 32-bit version. However, all functions can be ran on the 64-bit system after the compilation besides DXF.

In conclusion, I consider that this is a successful project. I am not only learned knowledge from the project but also made some contribution for the company. I urgently hope to use what I have learned from the experience of this project in the future work.

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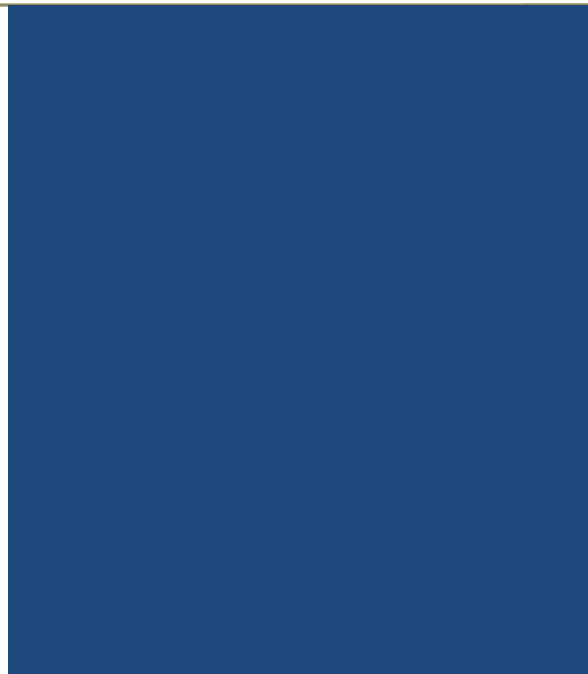
Project Plan

Graduation Project

12,09,2013

Table of content

Introduction

My name is Jue Wang and I am a final year student in the Fontys University. Now I am working on my graduation project in the Beijing TianYuan Technology Corporation Ltd. This company has remained sharply focused on offering software and all-in-one services in thermal and electromagnetic analysis areas. This includes design, prototyping, testing, etc. In this half year, I will build a database which can save .BMP or .JPEG image, .DAT file (one to one to .bmp image) and .CAD file respectively. I also need to make a user interface with various functions in this program such as fast data retrieval, data search and data edit, etc. Moreover, this project may be applied to existing software (for military radar data analysis); hence I need to make an obligate interface for the future using port.

Project Statement

Formal client

Actually, my formal client is my technical supervisor of my company since he is responsible for developing new utility.

Project leader

My project leader is my technical supervisor Dr.Zhang. He is responsible for all technical issues of software development. He will give instruction and timeline to me every week.

Current situation

This company is operating more than ten kinds of software from different countries. However, some of the software needs to be improved since there are a lot of Chinese customers made various requirements. My company has been lack of manpower in program development for a long time until I came to work on this intern position. Now the situation is that there is a radar analysis software need to input data manually. My leader wants to improve it recently; hence I need to make a program could to input data from database automatically. However, this is a totally fresh project until I take over it. Therefore, I need to make a new user interface and build a database from 0% of this project. Moreover, I have barely help from others since now I am the only intern on this position.

Project justification

My company supervisor said that they have a lot of plans to make some new programs that supports current software; however, they are really lack of manpower to do this before I came to this company. There are couples of software need to be optimized since the original program doesn't have some functions. Therefore, my project is a beginning of the chain improvement of my company.

Project product

The current situation is that this software (for military radar data analysis) needs to input data manually. In other word, it will be take very long time if user wants to count many data in one time. Hence they need a program can transfer data from database dynamically. I will build one or more databases, and then make a user interface with various functions to connect to the databases.

Project deliverable and non-deliverable

I need to deliver a program which has a user interface (with functions) could to connect a couple of databases. Our initial plan is to make several basic functions such as add, delete and edit data. In addition, the BMP image, DAT file, CAD image and AVI video can be viewed in this program. Additionally, I will use Access to make a database for this program, which will save data of BMP images and DAT files. I don't need to deliver mannul or course in this project.

Must:

A user interface has add data, delete data, view BMP/DAT files.

A database for saving BMP images and DAT files.

Should:

To edit DAT file and view BMP image in the same window.

To show datas from default local path in the user interface when running the program.

Could:

To view both CAD file and video, and open files from local path.

To make a function of data search which including search data type and key word.

To make a obligate code interface for future using.

Won't:

I won't make other version for Linux and IOS.

Project constraints

My formal client does not have certain restrictions on programming language since this project has just started in primary stage. Therefore, we decided using C# or C++

to make user interface and using MySQL or Access to build databases.

Project risk

I'm the only one developer in this team. My plan is try to finish my programming work in the early December of this year. Therefore, I think one risk of this project is that I need to concern about the deadline and quality of my work.

Project phasing

Description of a phase

Activities

Week 1 – Week 2: To adapt to the company environment, to learn and understand company's products. Meeting with my technical supervisor (Dr.Zhang) and discussing my project. In the meantime, Dr.Zhang helps me detail all parts of this project, and then I will hand in project plan.

Week 3 – Week 10: Programming two parts work: User interface (Visual studio) and Database (MySQL). Moreover, I will make a couple of vision of program, which can show the progress of this project.

Week 11 – Week 12: Testing and improving Demo of this project.

Week 13 – Week 16: Writing my final report and preparing the assessment.

Sub-deliverables

I will hand in a personal report to my leader to explain what I did in last few days. In this report, I will test my program first by myself. Then my leader and I both know what will happen when we use the program. After that, my leader Dr.Zhang will give me feedback. Moreover, we will have meeting weekly to discuss detail and plan next step of my project. In the last month of this half year, I will hand in a formal project report to both company and school.

Management plan

➢ ## Money

I don't really need to consider about money as an internship in my company. I think that one part of money use is our office rent; another part of money should be used for office supplies. Therefore, only my boss Mr. Du should to consider those two parts of money.

➢ ## Skills

My leader Dr.Zhang has working in Software Company about more than 5 years. He has decent experience in the programming area. He is not only response for technical support; also he had in charge of a couple of projects to optimum programming current software in the electromagnetic analysis

areas. Therefore, he has a lot of knowledge and experience could share to me in this half year. Personally, I have learning programming about 4 years, which I know a couple of programming languages such as C++, C#, MySQL, etc. Moreover, I know a lot of internet tools and office software. I believe that my basic computer knowledge will help me a lot when I need to do some research.

➤ Quality

The quality is one of the most important parts in our project. I will be the first quality checker. Then my project leader will check my work, after that, we will have meeting to discuss our last phase work. Then we will fix error and add modifications after the meeting. After all, then we will move to next phase work.

➤ Information

	Project plan	Project report	Deliverable	minutes
formal client	A, R,Di	A, R	R,Di	R
project leader	Dr, Ar, S,Di	Dr, Ar, S,R	R,Di, Ar	A,R

Dr Draw up
Di Discuss
A   Approve
S   Send
R   Receive
Ar Archive

➤ Time

Now I'm full time work on my internship. Hence it means I will work on this project about 40 hours per week plus some spare time. We need to finish this project before Jan. 2014 when I finish my internship. My leader and I will divide our tasks into small pieces work, and then we can track our work easily. Moreover, we have made short deadline about every two or three days for our tasks. Therefore, I have a clear timeline to work on this project

➤ Organization

In my project, the totally in charge person is my technical supervisor

Dr.Zhang, he also is my client in this project. He will make decisions on this project. Then he will give ideas to me and discuss the work process with me. Dh.Zhang will put pressure on me, and I will be the only person who response for my work. Moreover, I have responsibility for the deadline and completion of this project.