MOBILE ONLINE SIGN LANGUAGE
DICTIONARY TO IMPROVE
ENGLISH LITERACY AMONGST
THE DEAF

by

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The objective of this project is to create application that could assist in improving the English literacy of the Deaf. This application will also be accessible by mobile phone. The user will be able to use their cell phones to lookup the meaning of English phrases that are unknown to them and will receive a South African Sign Language translation of the English phrase as an MMS (Multi Media Service) on their phone. The software will look up the meaning of the English phrase in a database consisting of English words and its South African Sign Language (SASL) translation as a video clip. If no match is found, a no match notification message will be sent. The system, by checking the spelling of words and providing information on unknown phrases, may assist the user to acquire new words as part of his or her vocabulary and as such improve the users literacy. Experimental design is the methodology that was employed to answer the research question namely: Is it possible to improve the English literacy of the Deaf using mobile technology? Interviews were conducted to obtain the user requirements. These requirements were analyzed to find a potential solution. [Summarize the results. State the principle conclusions reached]
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The author wishes to [Click and type acknowledgments]
GLOSSARY

**SMS**, (Short Message Service) – is part of the GSM specification and allows text messages to be sent or received via mobile phones.

**MMS**, (Multimedia Messaging Service) – is also called Multimedia Messaging System. MMS is a communications technology developed by 3GPP (Third Generation Partnership Project) that allows users to exchange multimedia communications between capable mobile phones and other devices. It also defines a way to send and receive, almost instantaneously, wireless messages that include images, audio, and video clips in addition to text.

**DCCT**, (Deaf Community of Cape Town) – DCCT is a community of Deaf people who help themselves by helping each other. It is a non-governmental welfare organization founded in the 1987 whose aim was to address the need of Deaf people in the Western Cape.

**Deaf**, The ‘D’ is capitalized to denote membership of a linguistic and cultural community that uses sign language as a first language.

**SASL**, (South African Sign Language) - South African Sign Language is the language of the South African Deaf Community. It has a complex but complete grammar. Sign languages are used in other countries as well, for example in America the American Sign Language is used and is similar to the French sign language. It is a visual language created by the Deaf community and is used by an identifiable social language community, so it lives and changes as the society changes.

**IP**, (Internet Protocol) – is the primary protocol in the Internet Layer of the Internet Protocol Suite and has the task of delivering distinguished protocol datagram’s(packets) from the source host to the destination host solely based on their addresses.

**NetBeans IDE**, It is an Open-source Integrated Development Environment for software developers. It has all tools to create mobile applications with Java language, C/C++, and dynamic languages.
INTRODUCTION AND USER REQUIREMENTS

INTRODUCTION

South Africa Sign Language is the language of South African’s Deaf communities. It is a real, full, grammatically complex language. The language is South African and not used in other countries although similar dialects are used in other countries, America and Germany [5]. It is visual language created by the Deaf community and is used by an identifiable social language community, so it lives and changes as the society changes.

Improving the English literacy of the Deaf may reduce their dependency on others for the interpretation of written text. The question is: is it possible to improve the English literacy of the Deaf using mobile technology? Well it’s difficult to say, there are devices and software systems currently that assist Deaf people to bridge the communication gap between the Deaf and the hearing. One good example of software that may improve English literacy amongst the Deaf is the online sign language dictionary. The software allows Deaf people to key in a word and it then displays the sign language translation of the word. To use the software, a web browser and an Internet connection is needed. Having access to the Internet with a cell phone, will allow Deaf users to use it anywhere.

Mobile phones (cell phones) have the potential to improve the written English literacy of the Deaf. By checking the spelling of words and providing information on unknown phrases, it may assist the user to acquire new words as part of his or her vocabulary and as such improve the users written English literacy.
Most South African deaf people are English illiterate and thus find it difficult to function in the broader community. This project aims to assist these users by creating an opportunity to improve their written English by providing the software which will give them access to a “mobile English/South African Sign Language dictionary”.

Experimental design is the methodology that was employed to answer the research question. Interviews were conducted to obtain the user requirements. These requirements were analyzed to find a potential solution. The system will be designed as a prototype and will be tested by at least one user. After the testing a second interview will be conduct to guarantee the functionalities required of the users.

Give the principal results of the investigation.

USER’S VIEW OF THE PROBLEM
To determine how the users view the problem, interviews were conducted with the Deaf Community of Cape Town (DCCT). The user requirements were obtained by interviewing five Deaf persons on the 18th March 2009. Although a questionnaire with several questions was prepared these were only used as probes for the interview. The interviews were semi structured.

During the interview, obtained on the 18th March 2009,-an interpreter had to be brought to make communication easier. The interpreter was a partially Deaf person that could understand both English and sign language. The users were interviewed in English but the interpreter was translating the questions in sign language for Deaf users to understand, and it was also the other way around when the Deaf users were answering. Most of the people interviewed, were shy to answer. This may be due to their English literacy level. Most of the
people interviewed were born deaf. They like to use cell phones mainly for SMS’s and they understood what the intension of my project is.

The intension of the project is to improve the English literacy level of the Deaf through the innovative use of a SASL (South African Sign Language) dictionary. Some of the stakeholders prefer to use computers when compiling SMS’s and not cell phones. All users have access to cell phones at home and they all agreed that using cell phones may improve their literacy.

The following questions were then posed to the interviewees:

I. Which aspect of the proposed cell phone application is attractive?

II. What in your opinion are the negative aspects of the proposed software application?

III. How would you propose to improve the cell phone application?

IV. How would you suggest people could use the cell phone as a literacy tool?

V. What is the literacy level amongst the Deaf community you serve?

In Table 1 all five persons sees the SASL video’s explaining the words/phrases as attractive. Only person2 sees the SMS part as attractive. For question 2: person1 is concern about the time it will take to receive the video. Person2 is concern about the writing of the SMS’s; person2 doesn’t feel comfortable writing SMS’s. Person3 and person 4 is concern about the structure and the understanding of the sign language videos because different sign language has different structures and meanings.
<table>
<thead>
<tr>
<th>Question:</th>
<th>Person:1</th>
<th>Person:2</th>
<th>Person:3</th>
<th>Person:4</th>
<th>Person:5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SASL explain words</td>
<td>SMS &amp; SASL explaining the words</td>
<td>SASL explaining the words</td>
<td>SASL explaining the words</td>
<td>SASL video clips explaining the words</td>
<td></td>
</tr>
<tr>
<td>2 Time take to receive SASL video clip</td>
<td>Difficult to write text</td>
<td>Structure of the sign language</td>
<td>Understanding of the SASL video clips</td>
<td>No negative aspects</td>
<td></td>
</tr>
<tr>
<td>3 No answer</td>
<td>No answer</td>
<td>No answer</td>
<td>Grammar and terminology</td>
<td>Make it very basic</td>
<td></td>
</tr>
<tr>
<td>4 Basic text dictionary</td>
<td>Very basic</td>
<td>Dictionar y</td>
<td>As a sign dictionary</td>
<td>Correct spelling</td>
<td></td>
</tr>
<tr>
<td>5 95% level 1</td>
<td>Very basic</td>
<td>Very basic</td>
<td>Level1</td>
<td>Basic standard level</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: The responses of the interviewees are summarized.

For question 3 person1, person2 and person 3 did not give answers; they don’t have a problem with the system so they don’t want improvements on system.
Person4 and person5 want the system to have basic functionalities and that should include grammar and terminology functions. For question 4 all five persons want to use the system as a basic sign language dictionary. For question5 all five said the English literacy amongst them is very basic.

**A BRIEF DESCRIPTION OF THE PROBLEM DOMAIN**

This project focuses on the DCCT (Deaf Community of Cape Town). The DCCT is a community of Deaf people who help themselves by helping each other. DCCT is non-governmental welfare organization founded in the 1987 whose aim was to address the need of Deaf people in the Western Cape [4]. A Deaf person is somebody that cannot hear or is hard of hearing. They communicate using sign language. The reason for focusing on DCCT is to help the Deaf people to improve their English literacy skills by using mobile technologies mainly cell phones.

**COMPLETE DESCRIPTION OF THE PROBLEM**

The majority of Deaf people at DCCT is English illiterate and would like to improve their functional written English literacy to reduce their dependency.

**WHAT IS EXPECTED FROM THE SOFTWARE SOLUTION**

The software solution should prove a user friendly interface with all the functionalities required from the users. The core functionalities are to send text messages (SMS), do lookups and receiving videos (MMS).

**WHAT IS NOT EXPECTED FROM THE SOLUTION?**

The software will not include a spelling checker. The Deaf user will learn some new words and will understand English better however the system will not improve the sentence construction of the Deaf user nor does it claim to improve the Deaf user’s overall literacy – that is his reading or writing.
THESIS LAYOUT

Chapter 1 take a look at the introduction and user requirements, chapter 2 analyses the user requirements obtain in chapter 1. Chapter 3 will look at the user Interface Specifications and how users will interact with the system. Chapter 4 will be a High level design. Chapter 5 Low Level Design and chapter 6 will be the coding and implementation. The user manuals will also be included in chapter 6. Chapter 7 will look at the different problems encountered during the construction of the software and try solving them before the final due of the projects.

CONCLUSION

In this chapter the overview of the thesis and the requirements were discussed. According to the collected data the users indicated that the system could be used to improve their written English literate. This system will be useful because 95% of the Deaf are un-educated [9]. The other 5% that are educated have a level one education back ground-Which means their English literacy level will be very basic. The system will increase the effective use of their cell phones and at the same time could improve their English literacy level. The next chapter is about the analyzing of the collected user requirements. It will consider the problem from a designers’ point of view.
Chapter 2

REQUIREMENT ANALYSIS DOCUMENT

INTRODUCTION
In the previous chapter, the user requirements were discussed. The user’s point of the problem was discussed. This chapter looks at the problem from the designer’s point of view. The designers will discuss solutions and implementation methods. The user requirements will be analyzed in this chapter to make it possible to decide which solution will be the best to implement.

PROBLEM ANALYSIS
The target users (as mentioned in chapter 1) are the students and employees of DCCT. The people at DCCT use cell phones almost every day to SMS to each other. To solve this problem a sign language dictionary with a database containing SASL videos with titles must be designed.

The problem facing is that a cell phone dictionary interface that is connected to a sign language database through a protocol /network is needed to help assist Deaf with English literacy.

THE CURRENT PROBLEM
The problem facing now can be solved by designing a system that gives the user exactly what they want. Designing the system is possible but designing a system that satisfies all the needs of the users may not be possible. E.g. the database may not always have the video that the user want and that can be cause by users that does not type the phrases correctly.
CURRENT EXISTING SOLUTIONS

There are several systems that will allow the Deaf to reference English phrases. In this project only two of them will be briefly describe. These systems are the SMS/MMS system and the IP base system. For the SMS/MMS system the users only need a phone that support MMS, uses any service provider (MTN, Vodacom, and Cell-C) for SMS and MMS. In this system the users paid for the SMS per amount of characters used and for the MMS per kb depending on the services provider. The Thibologa Sign Language Institution offers SASL dictionary mobile services. Instruction to use the services is:

*SMS the word 'dictionary' followed by the word you're looking for - example 'Dictionary Hello' to 36922. (Cost R 5).*

If the word is in the dictionary, the system sends back an SMS with a link to the video. Accessing the link will allow you to download the appropriate video to your cellphone. If the word is not in the dictionary, then the system will sends back an SMS that says 'Sorry, that word is not available in the SASL dictionary at this time.' [6].

For the IP base system the user needs a computer or a phone with a web browser and internet in order to use these systems. Users using these systems will only pay for the use of internet. The target users of both this systems are Deaf and hearing people. For the IP base system the user open the web browser and go to sites like [www.mobile.org](http://www.mobile.org) and [www.signingsavvy.com](http://www.signingsavvy.com), and type the words and download the results. A negative aspect of this system is that it does not allow users to search for a phrase or a sentence.
### POSSIBLE SOLUTIONS TO IMPLEMENT

<table>
<thead>
<tr>
<th>SMS/MMS</th>
<th>IP</th>
<th>STAND ALONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEXT:WORDS</td>
<td>SMS pay for text</td>
<td>WEB HTML(XML)</td>
</tr>
<tr>
<td>DB SERVER</td>
<td>SMS gateway DB lookup for sign video</td>
<td>Web server DB lookup choose sign video</td>
</tr>
<tr>
<td>VIEW SIGN LANGUAGE VIDEO</td>
<td>User pay no price for mms</td>
<td>HTML(XML)</td>
</tr>
<tr>
<td>VIDEO</td>
<td></td>
<td>Web browser</td>
</tr>
</tbody>
</table>

Table 3: Summary of possible solutions

There is three different ways to test this project. The three ways are mention in the above in Table 3. This project will be first tested with the web base method. For this method the user will only pay for using internet. To start off all necessary software’s and tools need to be installed. MYSQL, PHP and APACHE need to be installed first. After all the installations and setups, a database can be created as a back end with an interface that allows the user to key in the text and a send button. Store the SASL video clips in the database, key in the text, do the look up if the words/phrases are correct spelled, and send the SASL video clip to the front end to view the videos. If it works for this method then it may also work for the SMS/MMS method.
**BEST SOLUTION**

The following steps describe how the system operates.

- The Deaf user key in the text.
- Press the send button to send the phrase/words to the database server.
- The database server does a spelling/grammar check.
- Do the lookup if the spelling and grammar is correct; otherwise send a notification to verify the spelling from the user?
- Database server send the appropriate sign language video explaining the phrase/words to the cell phone for viewing, otherwise send a notification if the video was not found.

**BREAKDOWN OF THE SOLUTION**

Figure 1 demonstrate how the system operates. The firstly the user choose the new message option, then type the message, e.g. hello, then select options and choose the number to send the message to then send the message. Secondly the database receives the word/words/phrases and does a spell check on it. If the spelling is correct then do the lookup. The lookup method will search for the key words in the message and compare it with the key words in the video titles. If any match is find. Then the database will send the video to the cell phone to be view otherwise it will send a notification message the video is not found.
Figure 1: Demonstrate the how the system operate

**DEVELOP TOOLS AND SOFTWARE**

NetBeans IDE- Use to create mobile applications with C/C++ or Java.

Nokia PC suite, JavaME, wireless messaging API2.0 (JSR-205) – create, send, and receive SMS, and MMS messages.

MySQL, PHP- Use to create database and database functions.

**TESTING METHOD**

The system will be tested by three computer science students in the computer science honours lab. The reason for that is to get feedback and ideas from experience users to change or improve the functionalities of the system. After
testing the system with the experience users, if will be tested with the Deaf users.

CONCLUSION
In this chapter the developer has analyze the requirements. Its analyzing was began by looking at the different solutions and current existing solutions that are similar to the current problem, then also the alternative solutions if any needed. The solution was broken down and at last the testing was discussed. The next chapter will analyze and discuss the interfaces.
Chapter 3

USER INTERFACE SPECIFICATION

INTRODUCTION
In the previous chapter, the user requirements were analyzed and discussed. The solution and the possible language of implementation were discussed. In this chapter the User Interface Specification is described: namely what functions the user interface will allow, what it will look like and how the user will be able to interact with the program.

DESCRIPTION OF THE COMPLETE USER INTERFACE
The interface will consist of three main functions which will be represented by different pages: the login page, a registration page and the message page. Users use the login page to logon to the system. A user will only be allowed to send and receive messages when logged in. The registration page is for new users to register and will add them to a list of users of the system. The message page is the interface that allows for a user to send and receive messages.

It will be considered to add the functionality of adding new video clips (with their English) translation to the existing database of video clips. An interface for the administrator of this system will be designed.

WHAT THE USER INTERFACE LOOKS LIKE TO THE USER
Login Page

This page will ask the user for his username as well as password (see Figure 2).
A user login form which allows users to logon to the system.

Message interface

This page will allow a user to type his name, the server’s IP address and also to type in the text message (see Figure 3).

The text message interface which allows the user to type in the messages.

The notifications page will indicate to the user that the message was sent off successfully (see Figure 4).
Figure 4: A notification message after the successful sending of a message.

Registration interface for new users.

This page will allow new users to register by fill all these fields (see Figure 5).

Figure 5: A registration form for new users to register in order to use the system.
HOW THE USER INTERFACE BEHAVES

The system interface and pages does not contain too much information per page in order to cater for users using cell phones. The smallness’ of cell phone screens make it difficult for users to view all the information on a webpage, compare to a computer screen. The system can be used anywhere; as users don’t necessarily need a computer to use the system. Users will also be able to access the system by using their cell phones. The only condition is that the cell phone the user uses must have web browsing capabilities and must be able to send SMSs and receive MMSs.

The interface send data (text message) to the database server by using the message page (see Figure 2) to key in the text and by pressing the send button the data will be sent to the database server. The data will be transferred to the database server by the http protocol. The database server transfer data to the interface through the web browser also using http protocols. The download page will be use to down load the data, so the user can view the data which will be the notification message or the sign language video (see Figure 5).

Figure 6: the sign videos down loading for users to view.
This page allows the users to download the sign language videos (see Figure 6).

**HOW THE USER INTERACTS WITH THE SYSTEM**

The users need to login to be able to send messages and have access to the other functions of the interface. When the user clicks on the login button the send page (Figure 3) will appear. In that interface the user will key in the text and the server IP address, when the user clicks the send button and the SMS is successfully sent the notification page (Figure 4) will appear. New users will use the registration page (Figure 6) to register as users.

**CONCLUSION**

In this chapter the User Interfaces were discussed. The different screens involved in the system where analyzed. In the next chapter, the different functions of the system will be discussed and the design will be explained.
Chapter 4

HIGH LEVEL DESIGN

INTRODUCTION
In the previous chapter, user interface specifications were options the system had to offer. In the chapter, the high level design is analyzed. This is an object-oriented view of the problem that is the various objects required for the solution are define and analyzed.

DETAILED BREAKDOWN OF THE TECHNICAL SOLUTION IN SUBSYSTEMS
The Sign Language dictionary will consist of the following subsystems (see Figure 8):

- Interface object – this interface object will represent one main interface with four links to represent each function. It will allow users to login, register, send SMS’s and receive MMS’s. Users must link to particular pages to used particular functions as shown in chapter 3.

- Messages Object – this object is responsible for the messages functionalities. It supports the interface object with these functionalities to make it possible for the users to send and receive messages using this interface.

- Database Object – this object represent the database. Database contains tables that are used to store descriptions explaining the SASL videos, the actual SASL videos and the users’ details.

- Server Object – this object represent the server. It can connect, disconnect interfaces, store files and it contains databases.
DESCRIPTIONS OF DATA STRUCTURE AND OPERATIONS REQUIRED FOR EACH SUBSYSTEM

The datastructure that will be used in this system is a database with the following fields:

The operations are depicted in the use case diagram (see Figure 7) and the following is a description of the various operations:

The diagram contains three actors: the user; the server database; and the mobile phone (cell phone) as well as the functions performed by these actors.

The functions that will be performed by the user are:

- Send a SMS using the SendMessage().
- Receive a notification message if video not found using the ReceiveMessage().
- Receive a MMS using the ReceiveMMS().

The functions that will be performed by the database server are:

- Lookup the appropriate SASL video using the Lookup().
- Send a notification message if the video is not find using NotificationMess().
- Send MMS using SendMMS().

The functions that will be performed by the mobile phone are:

The same as the user function since the user uses a mobile phone to send and receive messages.
Figure 7: The high level design of the sign language dictionary system
Figure 8: This is the objects represented in the sign language dictionary system.

DETAILED INTERACTION BETWEEN SUBSYSTEMS, INCLUDING INTERFACE SUBSYSTEM(S)

Figure 9: send an SMS to the server using the http protocol and receive a MMS.

The users sends a phrase to the server using the http protocol, to search for the sign language translation of the phrase and receive the sign language video or a notification message when the video is not found (see Figure 9).
CONCLUSION

In this chapter an analysis of the High Level Design was done. The various classes involved and how they are expected to interact with each other was described. In the next chapter the problem will be analyzed further, and the system will be described at a lower level.
Chapter 5

LOW LEVEL DESIGN

INTRODUCTION

In the last chapter, the classes used to solve the problem where looked at together with their attributes and the relationship between them. In this chapter we will have a closer look at those classes. The pseudo code of each object will be presented.

INNER DETAILS OF CLASS ATTRIBUTES

<table>
<thead>
<tr>
<th>Class</th>
<th>Attributes (Data types)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Messages</td>
<td><strong>Int serverIP:</strong> are used to store the address of the server.</td>
</tr>
<tr>
<td></td>
<td><strong>Int interIP:</strong> are used to store the interface addresses.</td>
</tr>
<tr>
<td>Webserver</td>
<td><strong>String database_name:</strong> are used to store the database names.</td>
</tr>
<tr>
<td></td>
<td>It also has the same attributes as the other classes make communications between these classes possible.</td>
</tr>
<tr>
<td>UserInterface</td>
<td><strong>Int interIP:</strong> are used to store the interface addresses and is needed when receive messages.</td>
</tr>
<tr>
<td></td>
<td><strong>Int serverIP:</strong> are used to store the server’s addresses needed when send the SMSs</td>
</tr>
<tr>
<td>Databases</td>
<td><strong>String database_name:</strong> are used to store the database name.</td>
</tr>
<tr>
<td></td>
<td><strong>String table_names:</strong> are used to store database table names.</td>
</tr>
<tr>
<td>Database_table</td>
<td><strong>Varchar description:</strong> are used to store the descriptions of the videos.</td>
</tr>
<tr>
<td></td>
<td><strong>Varchar directories:</strong> are used to store the video directories.</td>
</tr>
</tbody>
</table>

Table 4: descriptions of attributes for each class

The above table describes the class attributes involve in the solution (see Table 4).
INNER DETAILS OF CLASS METHODS

The table below describes the purpose of methods present in a class. These methods are coded in PHP (see Table 5).

<table>
<thead>
<tr>
<th>Class Name</th>
<th>Methods</th>
</tr>
</thead>
</table>
| Webserver    | **Public void lookup(keywords):**  
This method connects and disconnects the interfaces to the server. Its main purpose is to search for the keys in a message and compare it with the video descriptions, and send the SASL video to the interfaces for display. |
| Database     | **Public storedata():**  
This method stores the SASL videos and the corresponding descriptions in the database. It also stores the user’s details. |
| UserInterface| **Public downloadMMS():** this method downloads the video that is sent by the server.  
**Public void sendSMS():** this method is used to send the SMSs to the server. |

Table 5: Describe the inner details of each method present in classes.

PSEUDO-CODE

The purpose of each method is described in Table 5.

*UserInterface code:*

```java
Public void downloadMMS(){
   SendSMS();
   Download sign language video;
} //end of downloadMMS
```
Public void SendSMS(){
    send the SMS to server;
while(sended){
    print SMS sended;
}}//end of send SMS

Database code:
Public void storeData(){
    insertData();
    if(data data available){
        store the data;
    }else{
        printf(“error message could not store data”);
    } }//end of store data method

Webserver code:
This method connects and disconnects the interfaces to the server. Its main purpose is to search for the keys in a message and compare it with the video descriptions, and send the SASL video to the interfaces for display.

Public void lookup(){
    Connect(database)
    If(connected){
        Receive SMSs and do a lookup on the sign language video send it as a MMS;
        Close(connect);
    }else{
        Print cannot connect to database;
    }//end of lookup method

CONCLUSION
In this chapter the pseudo code requires to understand the solution was developed. The various class attributes and class methods were explained in detail. In the next chapter, we implement the solution based on the pseudo code obtained. Document code will be produced in the next chapter.
APPENDICES

APPENDIX A

PLANNING OVERVIEW

Table 1A describes the aims of each term. The aim of term one is done, only terms two, three and four still need be done.

<table>
<thead>
<tr>
<th>Term</th>
<th>Aim</th>
<th>Done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Requirements and Analysis</td>
<td>Done</td>
</tr>
<tr>
<td>2</td>
<td>Design and Development</td>
<td>End second term</td>
</tr>
<tr>
<td>3</td>
<td>Implementation and Coding</td>
<td>End third term</td>
</tr>
<tr>
<td>4</td>
<td>Testing and Debugging</td>
<td>End fourth term</td>
</tr>
</tbody>
</table>

Table 1A: planning for the rest of the year.
### APPENDIX B

#### PLANNING TERM 2

The emphasis of this term is design and development.

<table>
<thead>
<tr>
<th>Tasks</th>
<th>7&lt;sup&gt;th&lt;/sup&gt; April 09</th>
<th>14&lt;sup&gt;th&lt;/sup&gt; April 09</th>
<th>20&lt;sup&gt;th&lt;/sup&gt; April 09</th>
<th>28&lt;sup&gt;th&lt;/sup&gt; April 09</th>
<th>12&lt;sup&gt;th&lt;/sup&gt; May 09</th>
<th>25&lt;sup&gt;th&lt;/sup&gt; May 09</th>
<th>2&lt;sup&gt;nd&lt;/sup&gt; June 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments</td>
<td>Combined meeting</td>
<td>Combined meeting</td>
<td>Combined meeting</td>
<td>Combined meeting with supervisor</td>
<td>Combined meeting</td>
<td>Separate meeting with supervisor</td>
<td></td>
</tr>
<tr>
<td>Thesis Document</td>
<td>Edit/ update thesis – implement changes</td>
<td>Complete editing. Start with the write up of the UIS</td>
<td>Start write up of the HLD &amp; complete the UIS write-up</td>
<td>Submit updated Thesis document, Project plan</td>
<td>Complete write-up of HLD. Complete write-up. Hand in complete document to supervisor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HLD</td>
<td></td>
<td></td>
<td>Start with analysis the RAD to create HLD</td>
<td>Complete HLD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LLD</td>
<td>The three main handins</td>
<td></td>
<td></td>
<td>Start write up of LLD Complete LLD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UIS</strong></td>
<td>for this term</td>
<td>Start with User Interface Specification</td>
<td>Complete UIS</td>
<td>Update changes to UIS &amp; If needed - update changes to UIS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------</td>
<td>----------------------------------------</td>
<td>--------------</td>
<td>----------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GUI &amp; prototype</strong></td>
<td></td>
<td>Program GUI/prototype</td>
<td>Program GUI/prototype</td>
<td>Program GUI/prototype</td>
<td>Finalise GUI/prototype</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Previous projects</strong></td>
<td>Look at previous project</td>
<td>Look at previous projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Presentation</strong></td>
<td></td>
<td>Prepare slides for mock presentation on 26th May</td>
<td>Mock presentation Update presentation for The 2 June 2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Web-site</strong></td>
<td>Update web site</td>
<td></td>
<td>Check and update</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2A: detailed planning for term 2

**Red : means completed**  **Black means: still need to complete**
 ea.html>.
## INDEX

<table>
<thead>
<tr>
<th>D</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCCT · vi, x</td>
<td>MMS · vi</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>NetBeans IDE · vi</td>
<td>SMS · vi</td>
</tr>
</tbody>
</table>