

Implementation

6.1 Introduction

The software, hardware, graphical user interface design, design policies and segments used in implementation of IPS-IRD system will be discussed in this chapter.

6.2 Hardware & Software

The hardware and software which used in this project were listed down in *Table 1* and *Table 2*. These tools and equipments must be necessary for building the project and the evaluation.

For the Implementation of the proposed system, the existing hardware and software at the Department of Inland Revenue can be used and the required new hardware can be purchased. However as per the requirements for implementation, the department will have to purchase only few hardware equipments.

The **Hardware requirements** for the proposed IPS-IRD system:

Hardware	Cost
1. Server - 01	Rs.300,000/=
2. PCs - 300 (existing)	
3. Local Area Network - existing	
4. Printers - existing	
5. Total	Rs.300,000/=

Table 6. 1 : hardware requirements

Since Open source software was used for the development as well as the implementation. So, the software cost was zero for the proposed system.



The **Software Requirements** for the proposed IPS-IRD system is shown in table 6.2.

Software	
1. Database - MySQL	- Freely available under GPL license
2. Tool - PHP & Eclipse	- Available Under PHP license and Eclipse Public license 1.0
3. Server - Apache HTTP	- Available Under the Apache license 2.0
4. Platform Windows 2003 (for Sever PC)	- Available
Widows XP (for clients)	- Available

Table 6.2 : Software requirements

6.3 Technology

As using open source technology, we will have to get the new upgrades, necessary supports freely from the web.

Operating System	- Windows 2003, Windows Xp
Development Environment	- PHP, MySql
Designing Tools	- PHP, UML
Browser	- Fire fox / Internet explore

Table 6.3 : Technology used

6.4 Graphical User Interface

Graphical user interface creates the interaction between the system users and the system. So, it is an essential to design careful user interface. Good user interface design is critical for system dependability. There are some values should be in a good interface like, user-friendliness, consistency, minimal surprise, recoverability, user guidance, usability, robustness, tolerant and adaptable. So, on this design issues, the designer is faced with two questions [7].

1. How should the user interact with the computer system?
2. How should information from the computer system be presented to the user?

User interface design was done on identified different data channels. There were 11 GUIs designed to interact with the database using above specified channels for user groups with using few channels for all users.

UI number	Description
01	Login interface
02	Home page
03	Create user interface
04	Edit user interface
05	Delete user interface
06	Change password interface
07	Input information interface
08	Input files interface
09	Upload action interface
10	View new information interface
11	View past information interface
12	Report Interface

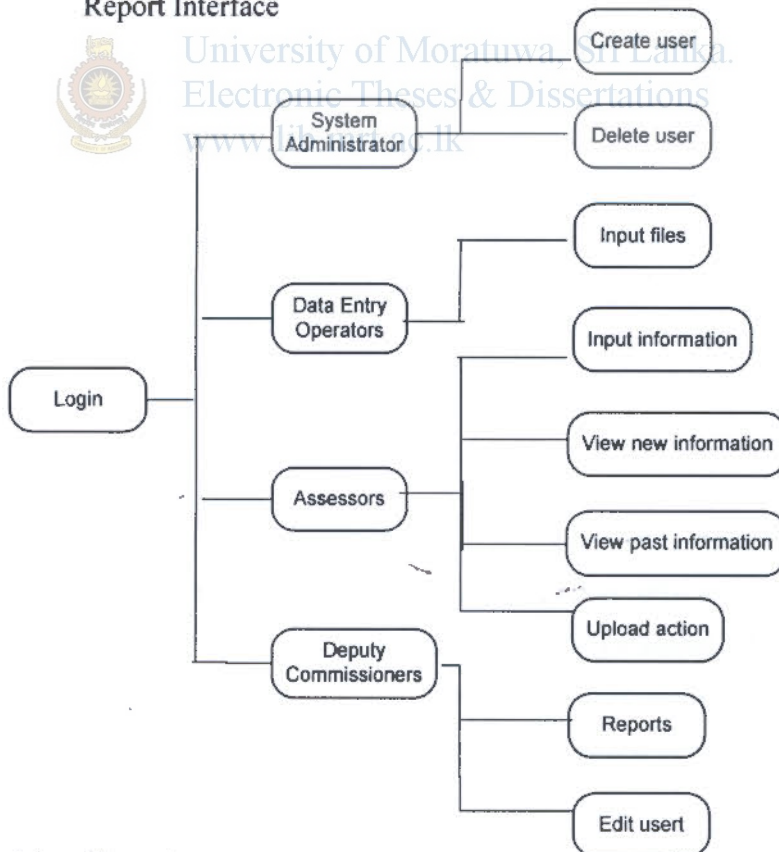


Figure 6.1 : Channels



6.4.1 User interface descriptions

With accordance to the above principles, all the interfaces designed for IPS-IRD system built on the common template using same block. Fonts, font styles, font sizes are standardized for the interfaces. Every interface has a header which shows the department logo (IRD Logo) in left corner and the main navigation items in right hand top corner. The left column of the interface is used to show navigations for other interfaces.

IPS-IRD system will be used by different users that have different roles. So the limited number of colors was used to manage complexity. The level of user education and the background environment of usage (official usage) also considered to select mostly indirect color preparations. Resolution of the monitor was considered while the interfaces were designing. The resolution used in interface designing was 1024 by 768 pixels.

UI design is done using Macromedia dream weaver tool with PHP and it could do easy connection with database using PHP programming language. Some GUIs were designed related to two types of input variables.

As an example;

Input information user interface is designed for two types of users; Assessors and Data entry operators. Assessors can input internal information. Data entry operators can input external information.

6.4.2 Sample user interfaces

As an example, log in interface to the system shown in *figure 6.2* it is included with The IRD Logo at the top-left of the picture. The Main Navigation paths are shown in top-right. Left column of the body shows the navigation for other channels. The right column will use for loading different interface body. In the footer column always shows the page link and the messages. *Table 6.4* describes the screen in shortly. Other GUI screen shots are included in *Appendix I*.

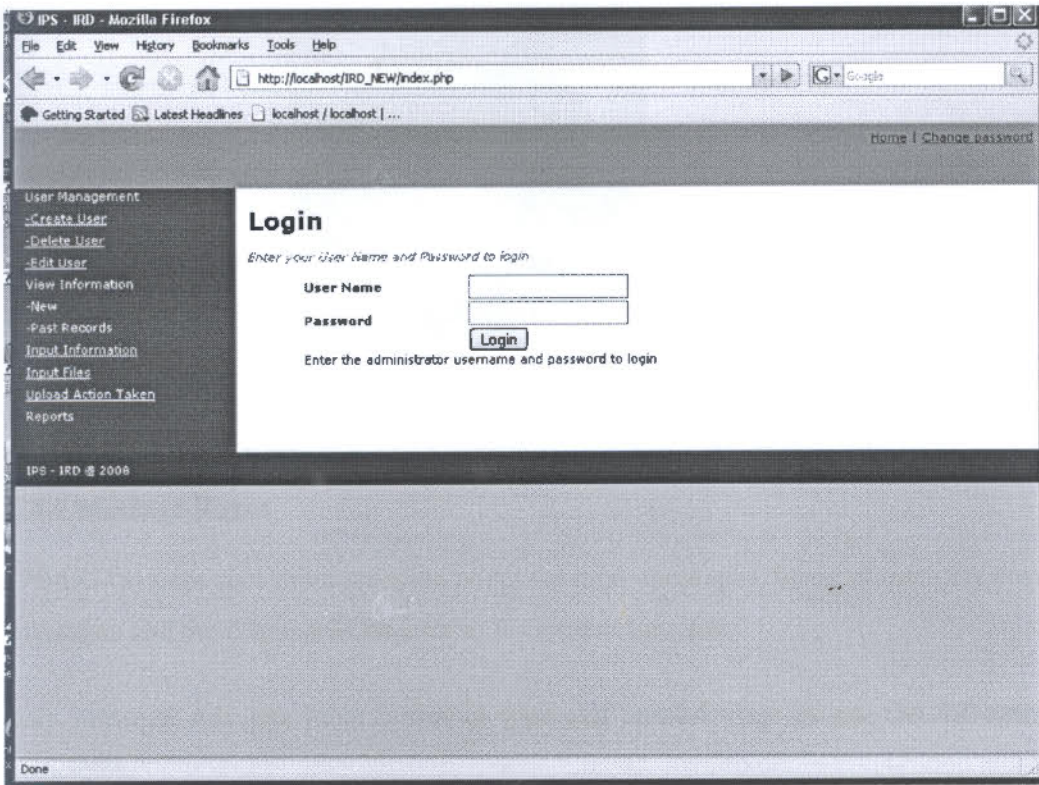


Figure 6.2 :Log in screen

Control Name	Type	Width	Height	Backg. Colour	Font	Font Colour
Log in screen	Form			—		—
Header left	Dept. Logo			8f99c0		—
Header right	Main Navigation			8f99c0		Black
Left body	Navigation to other interfaces			125c94		White
Right body	Different interfaces			ffff		Black
Footer Bar	URL & messages			33333		Black

Table 6.4 – Description for log in screen

6.4.3 Colour selection and fonts

Colours must be select carefully for GUI designing. Some users do not like most of colours with the colour blindness, so colour perceptions have to be done very carefully. Usually GUI designers select opposite coloures for background against font colours. This rule was followed by the IPS-IRD system also.

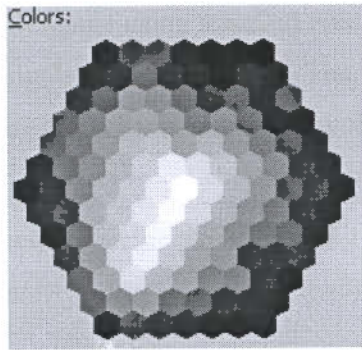


Figure 6.3 – Color wheel

6.4.4 Message Boxes

IPS-IRD system uses more message boxes for more messages. Some of them are error messages and the others will be used as for system function.

Any message box can have a special type and special view as per the following principles.

- Message box height and width depends on the length and the strongly ness of the message.
- Font type and size also of a message will be at different levels.
- Font colour is given as black for all messages as a common feature.
- Message box background colour will be standard to Windows theme.
- Images of message boxes will differ as to the theme of the message.

As an example, *figure 6.4* shows one message box and the description of the design given bellow to the figure.

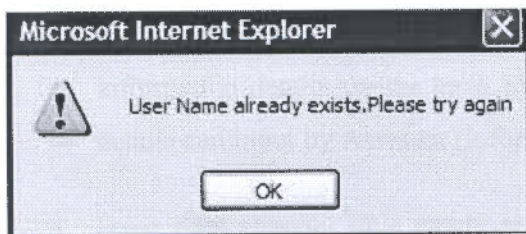


Figure 6.4: Message box

The message box was designed using standard model of message boxes. The symbol used in the design highlights error information. The “OK” button used to exit from the message after identifying the information given by that.

The identified data channels under the section 5.11.3 in the previous chapter were implemented as follows.

6.5 Implement Channels using user interfaces

- In Create user channel save user data to the database table Ird_User. The input is new user details such as user_id, allocated branch, commence date etc. Using SQL query, user details will be inserted to the database.
- Delete user channel removes user data from the database table Ird_User. Here, system administrator will select the user using dropdown list and adding “Select” button to retrieve from user table and after the confirmation to delete user, user will be deleted.
- Edit user channel update user data to the database table Ird_User and Tax_Files. In this channel Deputy Commissioners can edit user allocated branch, file allocation to a user or any other main details of a user. Here also drop down list uses to select the user.
- Change password channel updates secret user data to the database table Ird_User. This channel can be used by any user when he wanted to change his password as per security purpose. In this interface highly protected.
- Input information channel save new information data to the database table Tax_Information. This channel can be used by three type of users. External information details are the input by data entry operators. Internal information details can input by Assessor (information) or Assessor (tax).
- Input files channel save newly registered file records to the database table Tax_Files.

- Upload action taken channel updates action_description for information to the database table Action_Taken and the action-id with action_date. The action-id will be updated in Tax_Information table also. When uploading an action user have to select an information_id. There is an special thing that any user can select only one action description from drop down list at a time. Action_Taken table will save the details which was input by any user with the date and it will save if any action uploaded to the table, because it will store as new action.
- View information channel displays assigned new information or the past information records to the Assessors. As per to the session_id of a user, any Assessor (tax) can view information related to his file allocation only. The special function must be done by the IPS-IRD system to view information by the Assessors (information) is, system has to choose Assessors in the Information Branch in a random manner.
- Report channel displays records on information or uploaded actions individually or branch wise from tables Tax_Information or Action_Taken. This function will help to evaluate the efficiency of the proposed system.
- Exit channel logout any user logged to the database “ird” as power user.



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Special function must be described which not included as a channel is the explanation calling messages. This function must be done by the IPS-IRD system automatically, when the system failed to found any action uploaded to the Action_Taken table, the system displays all the information which with no action in red colour while action updates. It will display at the first time when he logged to the system to view information.

Since there is more than one page to do at a time, “Save” button used to save the page and redirect the same interface. “Reset” button used in some interfaces to set the same page not linked to the database at once when the input details must be corrected when any incorrect data written by any user.

After implementing the channels, different authority was assigned to each user groups. As an example Data Entry Operator can access only the external information input channel.

The application deploys using Internet Explore or Fire-fox browsers. It is ease to use in Windows.

6.6 User manual

According to described channels for GUIs, user manual designed for all users as follows. But there are disabled GUIs defined as user levels.

Current GUI	Activity	Result GUI
-	Log in	01
01	Link to home	02
02	Change password	06
06	Log in	01
01	Link to home	02
02	Input information	07
02	Input files	08
02	Upload action	09
02	View new information	10
02	View past information	11
02	Reports	12
02	Log out	01

Table 6.5 – User manual

Any user can change his channel not only be in the home page but also as to the authorized any other channel which he has user rights.

6.7 Summery

This chapter illustrated how the software implemented using designs and technologies described in previous chapter. The next chapter will be on the evaluation of the project and the testing.