

## **CHAPTER 6 : TESTING**

### **6.1 Testing**

During the system implementation, and after the system is implemented several testing procedures were carried out to check the functionality of the system.

The following main testing procedures were carried out in order to make sure the correct functioning of all the features of the system.

- Unit testing
- Module testing
- Integration testing
- System testing

The design had addressed the system functionalities effectively by decomposing system into modules. These modules have program segments to be tested. Hence, the testing was done on individual units of each module. Then the modules were integrated and tested for integration. Thereafter, the fully integrated system was tested.

In addition, the following list of tests was also carried out with the above-mentioned.

- Portability test
- Data validation test
- Test run with a set of hypothetical data
- Test run with a set of actual data

### **6.2 Testing Procedures**

Testing has to be done dividing the whole testing procedures mainly into two categories. That is due to the reason where the division of the whole system functionality in to two parts. Those are main data entry screens and processing, viewing screens. For individual data entry screen it has to follow the unit test procedures where as for the other processors the system testing was required.

Test data was used when testing inputs to each data entry screen. Sample test data sheets had been provided to the testing personnel. Then test results were analyzed and errors were fixed. Finally, the fixed version was again tested with same test data. This procedure was done repeatedly until the errors were no longer there (sample policy test data sheets are annexed in Appendix D).

### **6.2.1 Unit Testing for Data Entry Screens**

The basic unit testing for procedures to check the success of Save, Update, Delete functionalities were conducted for all master data entry screens and other data entry screens. Those entries are listed below.

- Recompense Master
- Tax Rule Editor
- Agreement Master
- Policy Master
- Advance Creation
- Travel Bill Creation
- Users Creation
- Address Information Entry

Other processing screens were also undergone for unit testing procedures depending on the given options in each of those screens. Processing button for Payroll Export processors, viewing options in some of the inquiry screens are some of these unit-testing areas.

Following is the Template of our Unit test plan:

**Figure 6-1 - Unit Test Plan**

|                                          |                 |                 |               |
|------------------------------------------|-----------------|-----------------|---------------|
| Unit Test Plan                           |                 |                 |               |
| Module                                   |                 |                 |               |
| Developer                                |                 |                 |               |
| Date                                     |                 | Version         |               |
| Pre Requisites                           |                 |                 |               |
|                                          |                 |                 |               |
| Functionality Test                       |                 |                 |               |
| Function                                 | Expected Result |                 | Actual Result |
| Save                                     |                 |                 |               |
| Update                                   |                 |                 |               |
| Delete                                   |                 |                 |               |
| Refresh                                  |                 |                 |               |
| Cosmetic – against the defined standards |                 |                 |               |
| Screen Size                              |                 | Button size     |               |
| Appearance                               |                 | Heading & Label |               |
| Color                                    |                 | Fonts           |               |
| Test Data                                |                 |                 |               |
|                                          |                 |                 |               |

### 6.2.2 System Testing

System testing was done in order to test the cross referencing impact between individual modules. This is the most important testing procedure for a system like Travel Management because most of the individual functionalities are bound each other by other sections, in other modules.

All the major modules, for example access maintenance, account maintenance, util maintenance, are dependant on the list of travel attributes, those are resides on the travel registration module. So it is a necessary procedure to check functionality of each of those

modules with the travel list, resides in the registration module to evaluate the final impact on those travel records.

Data entered by the traveller themselves such as accounting information are directly affect the procedures such as payroll processing, those are resides on two different modules separately. So it needs to do this system testing by combining all those data entries together with those motioned modules jointly.

### **6.2.3 Testing with the Actual Users**

Another procedure follows for the whole testing is by providing the system for Marakanda staff officers. It was done presenting the system to them with set of test data items. Feedback given by them also considered for the improvement of the functionalities of the system. Since they are the actual people who are going to use the system for their day-to-day activities, this kind of testing was very essential for the success of the system. Some of the suggestion given by them also has included as the work to be done in the future, under the heading of future work and plan in remaining chapters.

### **6.2.4 Consideration of Feedback from Testing**

- Some error messages were modified after considering feedback from testing people. Since meaningful error/warning messages and information messages increase the user friendliness as well as the ease of use.
- Data entry was minimized by providing default values to data entry points according to the feedback from the Marakanda staff members.
- The results of the final system testing are successful.

### **6.3 Additional testing procedures**

Several additional testing procedures were carried out parallel with the main test procedures.

### **6.3.1 Portability Test**

The system was tested on following platforms to ensure the desired functionality is platform independent.

- PC running Windows 2000 on Intel P4 processor with 256Mb of RAM
- PC running Windows XP on Intel P4 processor with 256Mb of RAM

### **6.3.2 Data Validation Test**

Several sets of unrealistic data patterns were entered at the user interfaces, to check whether error handling for all possible error types were implemented.

### **6.3.3 Test Run with a Set of Hypothetical Data**

A set of hypothetical test data was input to the program to check whether the program is functioning properly as expected. The input data were changed in steps and the output results were analyzed to make sure the procedures are functioning properly.

### **6.3.4 Test Run with Set of Actual data**

A set of actual test data obtained from Marakanda office was input to the system to check whether the system is giving the correct results.

### **6.3.5 Sample Text Cases**

#### **6.3.5.1 Test Case 1: Single day travel domestic with only basic information**

This test case tests the work flow of creation of a Single day domestic travel with only basic information.

#### **Pre-conditions for this test case**

User must be logged into the application

### Scenario

| UC Step | Step Description                                                 | Input Data                                                                                     |
|---------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 1       | Select travel > travel bill > create new travel bill             |                                                                                                |
| 2       | Select type of travel                                            | Travel policy as single day and user's home country as country                                 |
| 3       | Do not select any accounting, simply continue                    |                                                                                                |
| 4       | Enter basic information including the fields marked as mandatory | Start and end date must be within the same day.<br>Time must be entered in h : mm AM/PM format |
| 5       | Save as Preliminary                                              |                                                                                                |
| 6       | View Calculations                                                |                                                                                                |
| 7       | View Travel Bill                                                 |                                                                                                |

### Expected Result

View Calculation page and compare the amounts

Print travel bill print page

Print travel receipt page

### 6.3.5.2 Test Case 2: Single day travel domestic with travel advances, accounting and deductions

This test case tests the work flow of creation of a Single day domestic travel with basic information, travel advances, accounting information, meal deductions and night allowances.

### Pre-conditions for this test case

User must be logged into the application

### Scenario

| UC Step | Step Description                                     | Input Data                                                     |
|---------|------------------------------------------------------|----------------------------------------------------------------|
| 1       | Select travel > travel bill > create new travel bill |                                                                |
| 2       | Select type of travel                                | Travel policy as single day and user's home country as country |
| 3       | Select travel advances connected to bill             | Tick the check boxes for relevant travel                       |

|   |                                                                  |                                                                                                                                        |
|---|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|   |                                                                  | advances                                                                                                                               |
| 4 | Enter basic information including the fields marked as mandatory | End date must be next day morning but must be a time before the day per diem (6.00 AM).<br>Time must be entered in h: mm AM/PM format. |
| 5 | Enter main accounting details                                    | Select a cost center and project from the list that appears by clicking the icon next to the fields                                    |
| 6 | Enter meal deductions                                            |                                                                                                                                        |
| 7 | Save as Preliminary                                              |                                                                                                                                        |

### Expected Result

View Calculation page and compare the amounts

Print travel bill print page

Print travel receipt page

Sample test cases used in the system will be display in the **Appendix E** of this document.

### 6.4 Summery

Various testing phases that were applied on the system are discussed in detail. Also, test plans with test cases and test results are available. A suitable testing environment is also presented.

Following chapter will discuss about evaluation of the system.