CHAPTER 3: REQUIREMENT ANALYSIS

3.1 Requirements Gathering

At the start of the project, the travel management process handled by the admin department was studied in detail by using the basic requirement gathering methods.

3.1.1 Identification of Requirements

Based on the system analysis carried out on the travel management activities, a detailed requirements specification for the project was arrived. During the process, several users in the admin department and domain specialist were interviewed and consulted to determine specific functional requirements, system properties and characteristic, which the system must exhibit and must not exhibit. Following procedures were followed for the capturing purpose of requirements.

3.1.2 Interviews

Interviews are one method used to gather information. In order to understand the necessary details relate to the administrative activities of travel. Business domain specialists who are mainly involved in travel activities were interviewed. And for the identification of day-to-day activities, interviews were held with admin department staff member who involved in travel activities.

3.1.3 Document Analysis

Documents prepared for the purpose of collecting information from employees and travel agent were obtained and analyzed. All the necessary details related to the travel activities are captured using these documents provided by the admin department. These documents are mainly the Advance request form, Claim form, Booking request form, etc.

3.2 Requirement Specification

3.2.1 Product functions

Travel expense system will cater for mainly two types of travels,

- International Travel
- Domestic travel

Again these two types can be divided in to multi day and single day travel. According to these types the business rule that has to be applied on a travel, will be changed. Following information will be captured in a single travel bill.

1. Basic Travel data
2. Meal Information
3. Travel Times
4. Other Expenses
5. Car Expenses
6. Interruptions

According to the time duration, country of visit, and the contract between employee and employer, the allowance amount for a day will be changed. When user enters, basic information, the system will calculate the correct allowance amount using the entries defined. For that purpose the application will allow to define agreements with relevant amount for varies conditions.

After user enters the travel expenses, it will be sent for approval. At the same time the approver should be notified by a message (email) that there is a travel bill pending for his/her approval. When approver approved the travel bill, it will be ready for payments and payment department should be notified.

Within this application user should allow to do the following functions

- Create a travel bill
- Edit travel bill
- Delete travel bill
- Copy travel bill
- Search travel bills

- Approve travel bill
- Reject travel bill
- Define agreements
- Load Agreements
- Search Agreements
- Edit Agreements

And also generate reports and queries on such data

Travel bill can be created only after the business trip but before the business trip user should be able to obtain the cash advance, whilst registering the travel bill, advance should be able to connect.

3.2.2 Product perspective

My client requested me to do the component based developments for this application. They have several component built previously for maintain. So I have to use those components to my application as plug-ins. It reduced lot of development time as well as increased the stability of the project. I am totally concentrate on business perspective other than access control and other common things. Here is the short description of the common modules which I supposed to use during the development process.

1. Util component – mutil

This component has lot of reusable methods such as date conversion, internationalization related methods, etc. So during the development of the application I can use lot of methods available in this component, instead of rewriting those. Using these generic component will very much helpful in maintenance stage of the application.

2. WAF component – mwaf

WAF is stands for Web Architectural framework. This component is supported to user friendly GUIs. Within the application I can extend lot of classes from base classes available in this component. It allows enabling more features in the GUI with very less work. As a result of this component it is able to give the same effect in all GUI thorough out the application. The WAF component also supports to use the branding to enable customer specific color schemas and themes on GUIs.

3. Access component – maccess

This component is used to give the access to the application. Access control facilitates to the following functionality of the application

- Managing Users
- Managing User Roles
- Managing security access level for each role.

This component facilitates grant access to UI for relevant roles. So I don't want concentrate about user login access to the system within my project implementation and this access component is taken care about all the permission access to the system.

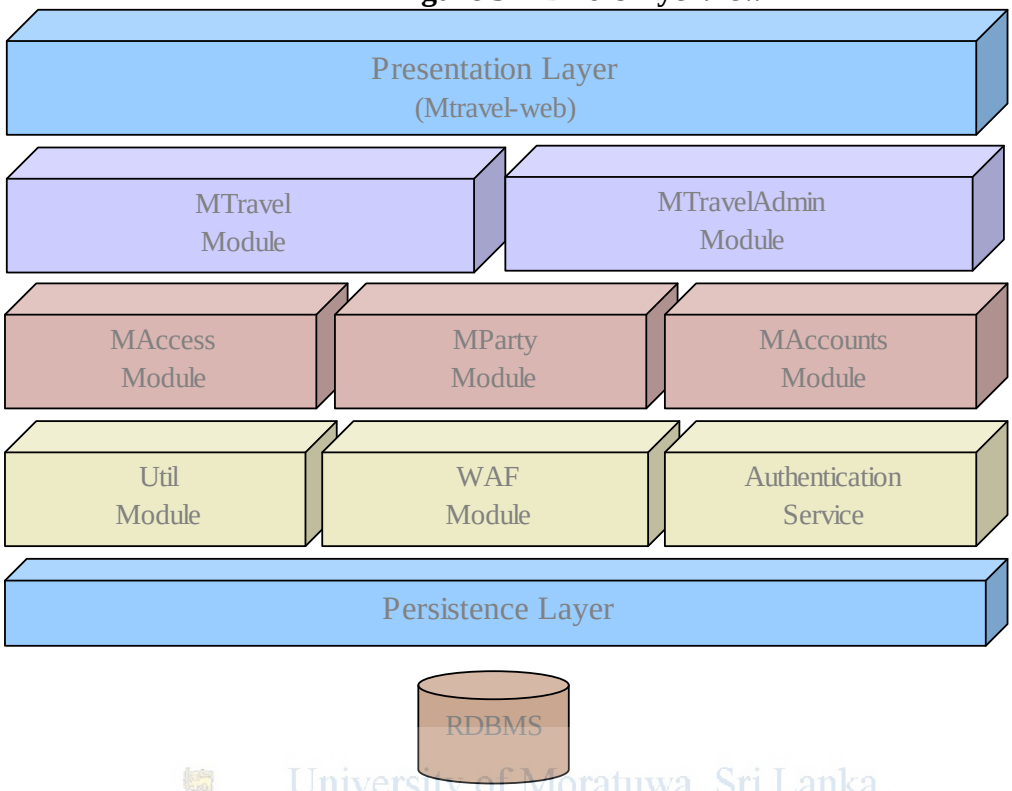
4. Party component – mparty

This component is used to maintain employee details of the company. Facilitates to the functionality of the application such as maintain employee details, maintain relationships like employees, managerial, approvers, administrators , reviewers and also allow to maintain the company hierarchy. It is much easier and less development time of my project because the availability and easy pluggable facility of this component.

5. Account component – maccount

This component is used to maintain company account information. Since this application is related to expenses of the company it should link with the company accounting system. Therefore I have to integrate the account component to the application. As a result of this integration it will be able to export the travel bill information to the external systems such as payroll and invoicing. My customer wishes this feature since it enable the payments of travel bill through existing payroll system of the company.

Figure 3-1 Bird's Eye View



3.2.3 User Interfaces

My client requested me to do the specific layout that should contain all UI used with user interaction. Basically it should contains Company logo, Date, Login user and Company name, Menu bar with sub menu navigation, Message area, Help Test area, and Footer

Figure 3-2 Generic Layout

<table>
<tr><td>Company Log</td><td></td><td>Date
Login User Name
Company Name</td></tr>
<tr><td colspan="3">Menu Bar with Navigation</td></tr>
<tr><td>Message</td><td>Body</td><td>Help Text</td></tr>
<tr><td colspan="3">Footer</td></tr>
</table>

3.2.4 User characteristics

Basically no need prior education on the system as well as the technical background. Since this is on line system user should have knowledge about internet access.

3.3 General constraints

3.3.1 Hardware Constraints

For the Travel Management System to be efficient and fully functional, a minimum computer system of Intel Pentium VI – 1000 MHz Processor or above, with at least 512MB of RAM and at least 10 GB Hard disk space, for server configuration. For the client configuration, any Pentium machine is sufficient with Internet Explorer 6.0 or higher or any other compatible browser installed.

3.3.2 Software Constraints

The OS platform for this software shall be any 32-bit version of Microsoft Windows OS mostly Microsoft Windows 2000 flat form with,

- JBOSS Application server
- Oracle Version 10g
- Internet Explorer 6.0 or higher or any other compatible browser.

3.3.3 Security Constraints

Users will require a valid login id and password to login to the system.

Any reliable and proven, commercially available virus guard software, which has a built in web virus wall and http packet filtering is necessary to protect from malicious attacks. Any reliable and proven firewall software is needed in order to secure the data inside the system from outside user.

3.3.4 Other Constraints

- Users will require a valid login id and password to login to the system
- The client should be able to see the most important details in the page without scrolling up and down.
- A sophisticated menu system has been introduced, through which the users can go to any page easily.
- The software should be easy to use.
- The screens and messages should be self-explainer.
- The programs should use the memory, CPU time and other resources efficiently.

3.4 Specific requirements

These are the requirements captured during the requirement gathering.

3.4.1 Functional requirements

- Users should be allowed to claim their traveling expenses related to official visits.
- System should support both domestic journeys and international journeys.
- Travel Expenses section should be categorized into two sub sections as Travel Bill and Travel Order
- Travel Bill should be to capture data related to the tour after the visit. And it should be divided in to four sub sections as creating a travel bill, Authorization, Review and payments.
- Travel Order should allow a user to make a booking by traveler himself and for request any travel advances before the tour.
- Relevant data can be entered to the system by traveler him/herself or by a secretary.
- Travel Bill should contain following 6 sub categories
    - Basic Travel data
    - Meal Info
    - Travel Times
    - Expenses - there can be several expense types

- Car Expenses
- Interruptions

- System should capture traveler name or id, destination, time period, purpose and some accounting info as basic data of the visit.
- System should allow car usage and claim the car expenses for some employees.
- All interruptions during the visit also should be captured.
- After user enters the relevant data the final travel bill should be calculated automatically using a predefined travel agreement in the system.
- When complete entering the data the travel bill should be send for approval. There can be more than one person involve in to this approval process of a particular bill.
- There should be tracking the user who entered the travel data (Secretary or traveler).
- Approver can approve or reject a travel bill. When approver rejects the bill system should notify to the traveler.
- Following should be the activities can be performed during the process of Travel bill, Travel order and Travel advances

  - Create : Travel Bill / Travel Order / Travel Advances
  - Copy : Travel Bill / Travel Order / Travel Advances
  - Edit : Travel Bill / Travel Order / Travel Advances
  - Approve : Travel Bill / Travel Order
  - Reject : Travel Bill / Travel Order
  - Remove : Travel Bill / Travel Order / Travel Advances

- Inquiry activities

  - Search : Travel Bill / Travel Order / Travel Advances
  - List : Travel Bill / Travel Order / Travel Advances

- Users with no valid employment should not allow creating new Travel bill. I.e. when there is an employment stop date, in the user's profile, which has been passed by the current date.
- The traveler's default accounting information should be copied to the accounting fields in the travel bill as default value.

- The traveler and secretary should allow editing travel bills with the state Preliminary or Rejected. The approver/reviewer can edit others travel bills with the state definitive/approved.

3.4.2 Non Functional requirements

- System should cater at least 35 concurrent users.
- All the UI should be unique and running both IE and Firefox browsers.
- Support both English and Swedish languages (not the user entered data).
- Reports are exported to different formats (excel, csv, txt)
- Deployment should not be depending on the operation system (either Windows or Linux).
- Every caption should self explanation
- Valid user/password

3.4.3 Interface Requirements

A mouse and keyboard are needed to interact with the interfaces of the system, both for entering text and for executing some of the processes. In order to execute, the product requires a system with a web browser. A connection to the Internet or to the local intranet, which the system is running, is also required.

3.5 Summary

Requirements analysis of the system is considered in detail. Identification of requirements is also discussed. The use of system to obtain the identified aim and objectives are argued. System specification is also given.

Following chapter will discuss about how the system design.