Librehatti

Project Report

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Abstract

Librehatti Project discusses the work done in Testing and Consultancy Cell and in what way that work is made easier using this Software. This project is not only concerned about only one department. However it can be used universally by any department just by changing the content of Database. Librehatti is the use of control systems and information technologies to reduce the need for human work in the production of goods and services. Raw data storage, electronic transfer, and the management of electronic business information comprise the basic activities this system.

TCC Project was made keeping in mind the type of work done in this cell and how this software would help to do the same work but reducing the work load to a great extent. Automation of manual work had been the main concern.

Also, this project is completely open source and is made using Django, Html, Python, CSS, JavaScript, Bash Script and MySql and the entire code is available to the user as and when required. There is also Complete develper Documentation as well as User manual alongwith it for making the developing and using the Software a lot easier.

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CHAPTER 1

INTRODUCTION TO ORGANISATION

I had my Six Weeks Institutional Training at TCC (Testing And Consultancy Cell), GNDEC Ludhiana. Guru Nanak Dev Engineering College was established by the Nankana Sahib Education Trust (NSET) Ludhiana. The Nankana Sahib Education Trust (NSET) was founded in memory of the most sacred temple of Sri Nankana Sahib, birth place of Sri Guru Nanak Dev Ji. With the mission of Removal of Economic Backwardness through Technology Shiromani Gurudwara Parbandhak Committee (SGPC) started a Polytechnical was started in 1953 and Guru Nanak Dev Engineering College was established in 1956.

NSET resolved to uplift Rural areas by admitting 70% of students from these rural areas ever year. This commitment was made to nation on 8th April, 1956, the day foundation stone of the college building was laid by Dr. Rajendra Prasad Ji, the First President of India. The College is now ISO 9001:2000 certified.

Figure 1.1: Guru Nanak Dev Engineering College

Guru Nanak Dev Engineering College campus is spread over 88 acres of prime land about 5

Kms from Bus Stand and 8 Kms from Ludhiana Railway Station on Ludhiana-Malerkotla Road. The college campus is well planned with beautifully laid out tree plantation, pathways, flowerbeds besides the well maintained sprawling lawns all around. It has beautiful building for College, Hostels, Swimming Pool, Sports and Gymnasium Hall Complex, Gurudwara Sahib, Bank, Dispensary, Post Office etc. There are two hostels for boys and one for girls with total accommodation of about 550 students. The main goal of this institute is:

- To build and promote teams of experts in the upcoming specialisations.
- To promote quality research and undertake research projects keeping in view their relevance to needs and requirements of technology in local industry.
- To achieve total financial independence.

1.1 Testing and Consutancy Cell

My six weeks Industrial Training was done at Testing & Consultancy Cell, Guru Nanak Dev Engineering College, Ludhiana under the guidance of Dr. H.S.Rai (Dean Testing & Consultancy Cell). Testing and Consultancy Cell was established in the year 1979 with a basic aim to produce quality service for technical problems at reasonable and affordable rates as a service to society in general and Engineering fraternity in particular.

Figure 1.2: Testing & Consultancy Cell

Consultancy Services are being rendered by various Departments of the College to the industry, Sate Government Departments and Entrepreneurs and are extended in the form of expert advice in design, testing of materials & equipment, technical surveys, technical audit, calibration of instruments, preparation of technical feasibility reports etc. This consultancy cell of the college

has given a new dimension to the development programmers of the College. Consultancy projects of over Rs. 1.36 crores are completed by the Consultancy Cell during financial year 2011-12.

Ours is a pioneer institute providing Consultancy Services in the States of Punjab, Haryana, Himachal, J&K and Rajasthan. Various Major Clients of the Consultancy Cell are as under:

- Larson & Turbo.
- Multi National Companies like AFCON & PAULINGS.
- Power Grid Corporation of India.
- National Building Construction Co.
- Punjab State Electricity Board.
- Punjab Mandi Board.
- Punjab Police Housing Corporation.

CHAPTER 2

LaTeX

2.1 Introduction to LaTeX

LaTeX, I had never heard about this term before doing this project, but when I came to know about it's features, found it excellent. LaTeX (pronounced /letk/, /letx/, /ltx/, or /ltk/) is a document markup language and document preparation system for the TeX typesetting program. Within the typesetting system, its name is styled as LaTeX.

Figure 2.1: Donald Knuth, Inventor Of TeX typesetting system

Within the typesetting system, its name is styled as LaTeX. The term LaTeX refers only to the language in which documents are written, not to the editor used to write those documents. In order to create a document in LaTeX, a .tex file must be created using some form of text editor. While most text editors can be used to create a LaTeX document, a number of editors have been created specifically for working with LaTeX.

LaTeX is most widely used by mathematicians, scientists, engineers, philosophers, linguists, economists and other scholars in academia. As a primary or intermediate format, e.g., translating

DocBook and other XML-based formats to PDF, LaTeX is used because of the high quality of typesetting achievable by TeX. The typesetting system offers programmable desktop publishing features and extensive facilities for automating most aspects of typesetting and desktop publishing, including numbering and cross-referencing, tables and figures, page layout and bibliographies.

LaTeX is intended to provide a high-level language that accesses the power of TeX. LaTeX essentially comprises a collection of TeX macros and a program to process LaTeXdocuments. Because the TeX formatting commands are very low-level, it is usually much simpler for end-users to use LaTeX.

2.2 Typesetting

LaTeX is based on the idea that authors should be able to focus on the content of what they are writing without being distracted by its visual presentation. In preparing a LaTeX document, the author specifies the logical structure using familiar concepts such as chapter, section, table, figure, etc., and lets the LaTeX system worry about the presentation of these structures. It therefore encourages the separation of layout from content while still allowing manual typesetting adjustments where needed.

```
\documentclass[12pt]{article}
\usepackage{amsmath}
\title{\LaTeX}
\date{}
\begin{document}
  \maketitle
  \LaTeX{} is a document preparation system
  for the \TeX{} typesetting program.
   \par
   $E=mc^2$
\end{document}
```

CHAPTER 3

INTRODUCTION TO PROJECT

3.1 Overview

LibreHatti is the use of machines, control systems and Information Technologies to optimize productivity in the production of goods and delivery of services.

LibreHatti is intended to provide elements which make it possible to simplify, improve, and automate the organization of the activities of a company or a group of people.

We show our ingenuity everyday through our associates' high level of performance. We provide solutions to help our clients improve internal processes, save money and deliver results. That is "ingenuity at work".

LibreHatti is all about using the computer to:

- Make your work less tedious.
- Trim hours off your workload.
- Reduce repetitive keyboard strokes or mouse-clicks.
- Make data entry easier with fewer tabs or mouse movements.
- Take any job you do longhand and make the computer do it for you.

The use of computer systems to execute a variety of office operations, such as word processing, accounting, and e-mail refers to what we call automation. LibreHatti is type of automation software that almost always implies a network of computers with a variety of available programs. LibreHatti helps in optimizing or automating existing office procedures.

LibreHatti Software is a Web Application Software for easy, quick, and secure date processing that will automate the tasks of a Testing & Consultancy Cell or any other Similare office. This involves maintaining information of client, verifying information provided by client, entering the jobs and then getting the Receipt Bill and Voucher automatically generated.

It is an enterprise software, so it is distributed and data centric. In this application, MySQL database will be used to store data related to employees, material, jobs, labs, tests, clients, amounts etc. Since database is on Server, so any number of users can work simultaneously and can share their data with each other. It is developed using Django, Python, HTML, CSS and JavaScript.

3.2 The Existing System

The Software running today does all the entry and management of the Jobs, all done by Consultancy employees. The existing system manage the generation of Bill, Recipts and Vouchers very efficiently.

Limitations of previous system

- There was no option to calculate organisation's share in total income.
- Search was poor.
- No option to see all registered clients on one click.
- It was difficult to add more than one non-payment jobs for single client. Every time they had to search client and then add job.
- "Note"section in performa bill was static.
- There was no option to search transport bills.
- Confirm job option was not working.

3.2.1 Software Functions In Existing System

Registeration & Login: The software user would be required to Register through a screen. After authentication and login he would be able to access only those areas for which he is capable to access.

Administrator Maintenance: Administrator can add or update the details, and also can see information of all employees and can see his or her information. New Database table information can also be added.

Employee Maintenance: As employees are directly related to clients, so they are able to add or update the details of clients using this section. Admin can see all the clients. Employees can manage their clients only.

Client Maintenance: Clients are the end users that benefit from the LibreHatti Software. A client can get information of all the available work done in Testing & Consultancy Cell also apply for same. They can also view the status of their previous works done in the Cell.

Catalog: Using the Catalog, the clients can get an estimate of price for all the tests done in the Cell. Catalog lists down all the works done in the Cell.

Report Generation: The Report generation for a material tested is made easier now. The reports generated can then be downloaded in pdf format and then can be given to the repective clients.

3.3 Requirement Analysis

A Software Requirements Analysis for a software system is a complete description of the behavior of a system to be developed. It includes a set of use cases that describe all the interactions the users will have with the software. In addition to use cases, the SRS also contains non-functional requirements. Non-functional requirements are requirements which impose constraints on the design or implementation.

- **Users of the System**
  - Administrator : Administrator can add or update (activate/inactivate) the details, and also can see information of all employees and can see his or her information. New labs, materials or tests can be added or the existing can also be updated.
  - Employee : As employees are directly related to clients, so they are able to add or update the details of clients using this section. Administrator can see all the clients. Employees can manage their clients only, and particular client can see his or her detail.
  - Client : Clients are the end users that benefit from the LibreHatti Software. A client can get information of all services available, and thus can apply for same. They can also view the status of the number of the previous jobs done by them in the Organisation.

3.3.1 Functional Requiremets

- **Specific Requirements**: This phase covers the whole requirements for the system. After understanding the system we need the input data to the system then we watch the output and determine whether the output from the system is according to our requirements or not. So what we have to input and then what well get as output is given in this phase. This phase also describe the software and non-function requirements of the system.
- **Input Requirements of the System**
  - Client Details
  - Job Details
  - Extra Charges Details
  - Lab Details
  - Organisation & Department Details
  - Rate List
  - Staff Details
- **Output Requirements of the System**
  - Interface for administrator to configure the system.
  - Listing of all the services offered.
  - Interface for clients and employees.
  - Automatic generation of Reports, Bills, Receipts, and Vouchers for clients.

  - Calculation of Job amount.
  - Generation of Registers with Certain requirements.

- **Special User Requirements**
  - Automatic Email Generation and Sending to the concerned person.

- **Software Requirements**
  - Programming language: Python 2.7
  - Framework: Django 1.4
  - Web Languages: Html, Java Script, CSS
  - Database: MySQL Database Server 5.1
  - Documentation: Doxygen 1.8.3
  - Text Editor: Gedit, Geany, Vim
  - Operating System: Ubuntu 12.04 or up
  - Debugger: Django Debugger, Django shell, Terminal
  - Web Server: Apache 2.4

3.3.2 Non functional requirements

- Scalability: System should be able to handle a number of users. For e.g., handling around thousand users at the same time.
- Usability: Simple user interfaces that a layman can understand.
- Speed: Speed of the system should be responsive i.e. Response to a particular action should be available in short period of time. For e.g., Updating the project tasks take few seconds for the changes if the entry is not starred.

3.4 Feasibility Analysis

Feasibility analysis aims to uncover the strengths and weaknesses of a project. In its simplest term, the two criteria to judge feasibility are cost required and value to be attained. As such, a well-designed feasibility analysis should provide a historical background of the project, description of the project or service, details of the operations and management and legal requirements. Generally, feasibility analysis precedes technical development and project implementation. There is some feasibility factors by which we can determine that project is feasible or not:

- **Technical feasibility**: Technological feasibility is carried out to determine whether the project has the capability, in terms of software, hardware, personnel to handle and fulfill the user requirements. The assessment is based on an outline design of system requirements in terms of Input, Processes, Output and Procedures. LibreHatti Software is technically feasible as it is built up in Open Source Environment and thus it can be run on any Open Source platform.

- **Economic feasibility**: Economic analysis is the most frequently used method to determine the cost/benefit factor for evaluating the effectiveness of a new system. In this analysis we determine whether the benefit is gain according to the cost invested to develop the project or not. If benefits outweigh costs, only then the decision is made to design and implement the system. It is important to identify cost and benefit factors, which can be categorized as follows:
  - Development costs.
  - Operating costs.

  LibreHatti Software is also Economically feasible with 0 Development and Operating Charges as it is developed in Django framework and python language which is FOSS technology and the software is operated on Open Source platform.
- **Legal feasibility**: In this type of feasibility study we basically determines whether the project conflicts with legal requirements, e.g. a data processing system must comply with the local Data Protection Acts. But LibreHatti Software has been developed for the Office Automation process with properly Licensed technologies. Thus is the legal process.
- **Operational feasibility**: Operational feasibility is a measure of how well a project solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. All the Operations performed in the software are very quick and satisfies all the reuirements.
- **Behavior Feasibility**: In this feasibility we check about the behavior of the proposed system software i.e. whether the proposed project is user friendly or not, whether users can use the project without any training because of the user friendliness or not. LibreHatti Software is very user friendly as it user interacts with it through web.

3.5 Objective

LibreHatti Software is a web based software and the main purpose of this project is to:

- Perform most of the task of Testing & Consultancy Cell online and make it dynamic.
- Make the Registration and Searching easier.
- Automatic calculation of the amount for the work done.
- Reduce the dependencies between people involved with the process.
- Increasing the transparency.

LibreHatti Software is basically designed for those companies or Organisations which provide different types of services to all types of clients. Keeping track of different works done by different clients and then getting all the reports of the work done is not an easy job. To make these tasks easy with all functions performed quickly,LibreHatti Software will be quiet helpful.

Administrator will be the super user of the application who will configure system information such as adding new products and there information or editing or deleting the old ones, managing employees and clients.

CHAPTER 4

TECHNOLOGIES USED

4.1 Django

Django is an open source web application framework written in python. It lets you build high-performing, elegant Web applications quickly. Django focuses on automating as much as possible. Django's primary goal is to ease the creation of complex, database-driven websites. Django emphasizes reusability and "pluggability" of components, rapid development, and the DRY principal. Python is used throughout, even for settings, files, and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models.

Django takes it's name from the early jazz guitarist Django Reinhardt, a gypsy savant who managed to play dazzling and electrifying runs on his instrument even though two of the fingers on his left hand were paralyzed in an accident when he was young.

Thus its a fitting name for the framework. Django can do some very complex things with less code and a simpler execution than youd expect. It doesn't take a heavy hand to build with Django. The framework does the repetitive work for you, allowing you to get a working website up quickly and easily.

4.1.1 Features of Django

- Clean URLs
- Object- Relational Mapping
- Loosely coupled components
- Designer-friendly templates
- Cache framework
- MVC architecture
- Jython support
- DRY (Don't Repeat Yourself)

4.1.2 Installation of Django

Installation of Django is very easy. To install Django version 1.4, type the following commands:

```
$ wget http://www.djangoproject.com/download/1.4/tarball

$ tar xzvf Django-1.4.tar.gz

$ cd Django-1.4

$ sudo python setup.py install
```

This will install the django on your system.

4.1.3 MTV

Django adopts the standard MVC (Model-View-Controller) design pattern. But instead, their naming convention is the MTV (Model-Template-View).

- **Model** is an object relational mapping to your database schema. So each model is a class which represents a table in your database. Django models provide easy access to an underlying data storage mechanism, and can also encapsulate any core business logic, which must always remain in effect, regardless of which application is using it. Models exist independent of the rest of the system, and are designed to be used by any application that has access to them. In fact, the database manipulation methods that are available on model instances can be utilized even from the interactive interpreter, without loading a Web server or any application-specific logic.
- **Template** is simply HTML for your views. It also allows you to display different messages depending on whether or not a user is logged in. Templates are Django's provided way of generating text-based output, such as HTML or emails, where the people editing those documents may not have any experience with Python. Therefore, templates are designed to avoid using Python directly, instead favoring an extensible, easy-to-use custom language built just for Django.
- **View** could be a homepage or a page to display a user's information, for instance. A view accepts user input, including simple requests for information; behaves according to the application's interaction logic; and returns a display that is suitable for user's to access the data represented by models.

4.1.4 Creating Prject in Django

If this is your first time using Django, you'll have to take care of some initial setup. Namely, you'll need to auto-generate some code that establishes a Django project- a collection of settings for an instance of Django, including database configuration, Django-specific options and application-specific settings. From the command line, cd into a directory where you'd like to store your code, then run the command

$ django-admin.py startproject mysite

This will create a mysite directory in your current directory.

4.1.5 Development Server in Django

Change into the outer mysite directory, if you haven't already, and run the command

$ python manage.py runserver

You'll see the following output on the command line:

```
Validating models...

0 errors found
Django version 1.4.2, using settings 'mysite.settings'
Development server is running at http://127.0.0.1:8000/
Quit the server with CONTROL-C.
```

Figure 4.1: Output of runserver

4.1.6 Database setup

In this, we need to edit the settings.py file of the Project, that is the configuration file. It's a normal Python module with module-level variables representing Django settings. Change the following keys in the DATABASES 'default' item to match your database connection settings.

- ENGINE – Either 'django.db.backends.postgresql_psycopg2', 'django.db.backends.mysql', 'django.db.backends.sqlite3' or 'django.db.backends.oracle'. Other backends are also available.
- NAME – The name of your database. If you're using SQLite, the database will be a file on your computer; in that case, NAME should be the full absolute path, including filename, of that file. If the file doesn't exist, it will automatically be created when you synchronize the database for the first time (see below). When specifying the path, always use forward slashes, even on Windows (e.g. C:/homes/user/mysite/sqlite3.db).
- USER – Your database username (not used for SQLite).
- PASSWORD – Your database password (not used for SQLite).
- HOST – The host your database is on. Leave this as an empty string if your database server is on the same physical machine (not used for SQLite).

If you're new to databases, we recommend simply using SQLite by setting ENGINE to 'django.db.backends.sqlite3' and NAME to the place where you'd like to store the database. SQLite

is included as part of Python 2.5 and later, so you won't need to install anything else to support your database.

While you're editing settings.py, set TIME_ZONE to your time zone. The default value is the Central time zone in the U.S. (Chicago).

Also, note the INSTALLED_APPS setting toward the bottom of the file. That holds the names of all Django applications that are activated in this Django instance. Apps can be used in multiple projects, and you can package and distribute them for use by others in their projects.

By default, INSTALLED_APPS contain the following apps, all of which come with Django:

- django.contrib.auth – An authentication system.
- django.contrib.contenttypes – A framework for content types.
- django.contrib.sessions – A session framework.
- django.contrib.sites – A framework for managing multiple sites with one Django installation.
- django.contrib.messages – A messaging framework.
- django.contrib.staticfiles – A framework for managing static files.

These applications are included by default as a convenience for the common case.

Each of these applications makes use of at least one database table, though, so we need to create the tables in the database before we can use them. To do that, run the following command:

```
$ python manage.py syncdb
```

The syncdb command looks at the INSTALLED_APPS setting and creates any necessary database tables according to the database settings in your settings.py file. You'll see a message for each database table it creates, and you'll get a prompt asking you if you'd like to create a superuser account for the authentication system. Go ahead and do that.

4.1.7 Django Applications used :

- **Django Registation**: It is an extensible user-registration application for Django. This is a fairly simple user-registration application for Django, designed to make allowing user signups as painless as possible. It requires a functional installation of Django 1.3 or newer, but has no other dependencies.
  Django Registation module can be installed easily using :

  ```
  $ pip install django-registration
  ```

- **Django Tagging**: This is a generic tagging application for Django, which allows association of a number of tags with any Model instance and makes retrieval of tags simple.
  Django Registation module can be installed easily using :

  ```
  $ pip install django-tagging
  ```

4.2 Python

Python is a dynamic language, as in python coding is very easy and also it require less coding and about its interpreted nature it is just exellent. Python is a high level programming language and Django which is a web development framework is written in python language.

Python is an easy to learn, powerful programming language.Python runs on Windows, Linux/Unix, Mac OS X. Python is free to use, even for commercial products. Python can also be used as an extension language for existing modules and applications that need a programmable interface. Python is free to use, even for commercial products, because of its OSI-approved open source license.

4.2.1 Features of Python

- Very clear, readable syntax.
- Strong introspection capabilities.
- Intuitive object orientation.
- Natural expression of procedural code.
- Full modularity, supporting hierarchical packages.
- Exception-based error handling.
- Very high level dynamic data types.
- Extensive standard libraries and third party modules for virtually every task.
- Extensions and modules easily written in C, C++ (or Java for Jython, or .NET languages for IronPython).
- Embeddable within applications as a scripting interface.

4.2.2 Installation of Python

Installation of python is a very easy proccess. The current python versions are: Python 2.7.1 and Python 3.2. Type the commands in the terminal:

$ wget http://www.python.org/ftp/python/2.7/Python-2.7.tgz

$ tar xzf Python-2.7.tgz

This will install the python on your pc/laptop.

4.3 MySQL Database Server

Although Django supports all the Databases like sqlite, Mysql, postgresql etc but I used the Mysql. It is world"s most popular open source database It is a relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. It is named after developer Michael Widenius's daughter, My. The SQL phrase stands for Structured Query Language. MySQL is written in C and C++.
Free-software-open source projects that require a full-featured database management system often use MySQL.

MySQL is also used in many high-profile, large-scale World Wide Web products, including Wikipedia, Google (though not for searches) and Facebook.

MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP web application software LAMP is an acronym for Linux, Apache, MySQL, Perl/PHP/Python. MySQL is used in some of the most frequently visited web sites on the Internet, including Flickr, Nokia.com, YouTube, Wikipedia, Google and Facebook.

One of the greatest advantage of Django is that it synchronises the database only with one command withouut having any need to send different queries for insertion, deletion, updation etc. There is a file named models.py which is used for purpose of creating database.

4.3.1 Features of MySQL

- MySQL is a database management system.
- MySQL is a relational database management system.
- MySQL software is Open Source.
- The MySQL Database Server is very fast, reliable, and easy to use.
- MySQL Server works in client/server or embedded systems.
- A large amount of contributed MySQL software is available.

4.3.2 Installation of MySQL

MySql can be installed using following commands:

```
$ sudo apt-get install mysql-server
```

```
$ sudo apt-get install mysql-client
```

4.4 Apache Web Server

Apache is a web server software notable for playing a key role in the initial growth of the World Wide Web. Apache is developed and maintained by an open community of developers under the auspices of the Apache Software Foundation. The application is available for a wide variety of operating systems, including Unix, FreeBSD, Linux, Solaris, Novell NetWare, Mac OS X, Microsoft

Windows, OS/2, TPF, and eComStation. Released under the Apache License, Apache is open-source software.

The goal of this project is to provide a secure, efficient and extensible server that provides HTTP services in sync with the current HTTP standards.

4.4.1 Features of Apache Server

- Apache supports a variety of features, many implemented as compiled modules which extend the core functionality. These can range from server-side programming language support to authentication schemes.
- Apache features configurable error messages, DBMS-based authentication databases, and content negotiation. It is also supported by several graphical user interfaces (GUIs).
- It supports password authentication and digital certificate authentication. Apache has a built in search engine and an HTML authorizing tool and supports FTP.

4.4.2 Installation of Apache Server

Apache web server can be installed using following commands:

```
$ sudo apt-get install apache2
```

4.5 Doxygen

4.6 Shell Scripting

4.6.1 Bash

Bash is a "Unix shell": a command-line interface for interacting with the operating system. It is widely available, being the default shell on many GNU/Linux distributions and on Mac OS X; and ports exist for many other systems. It was created in the late 1980s by a programmer named Brian Fox, working for the Free Software Foundation. It was intended as a free-software alternative to the Bourne shell (in fact, it's name is an acronym for "Bourne-again shell"), and it incorporates all features of that shell, as well as new features such as integer arithmetic and in-process regular expressions.

4.6.2 Shell

The shell is the program which actually processes commands and returns output. Most shells also manage foreground and background processes, command history and command line editing. These features (and many more) are standard in bash, the most common shell in modern linux systems.

4.6.3 Shell Scripting?

In addition to the interactive mode, where the user types one command at a time, with immediate execution and feedback, Bash (like many other shells) also has the ability to run an entire script of commands, known as a "Bash shell script" (or "Bash script" or "shell script" or just "script"). A script might contain just a very simple list of commands or even just a single command or it might contain functions, loops, conditional constructs, and all the other hallmarks of imperative programming. In effect, a Bash shell script is a computer program written in the Bash programming language.Shell scripting is the art of creating and maintaining such scripts.

Shell scripts can be called from the interactive command-line described above; or, they can be called from other parts of the system. One script might be set to run when the system boots up; another might be set to run every weekday at 2:30 AM; another might run whenever a user logs into the system.

Shell scripts are commonly used for many system administration tasks, such as performing disk backups, evaluating system logs, and so on. They are also commonly used as installation scripts for complex programs. They are particularly suited to all of these because they allow complexity without requiring it: if a script just needs to run two external programs, then it can be a two-line script, and if it needs all the power and decision-making ability of a Turing-complete imperative programming language, then it can have that as well.

4.6.4 Features of Shell Scripting

- Functions.
- Arrays.
- Commands like sed, awk.

- Use of mysql commands through shell-importing,exporting a database, etc.

CHAPTER 5

DESIGN

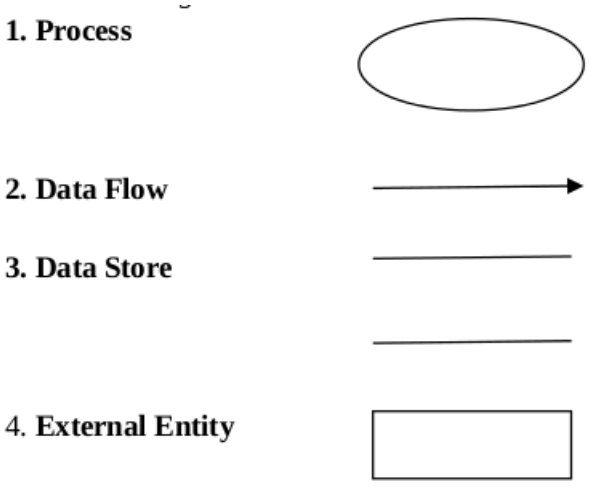
5.1 System Design

: Systems design is the process or art of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. One could see it as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering.

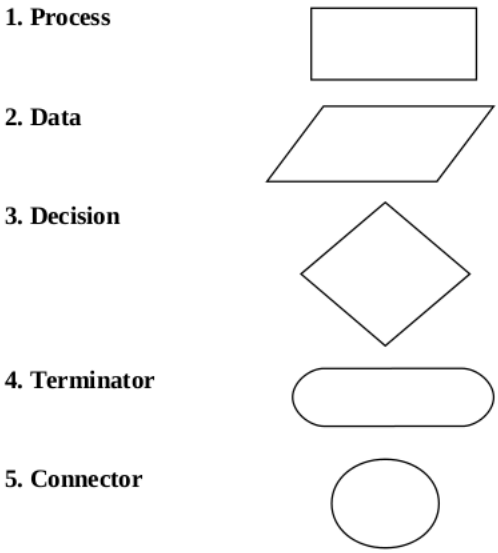
- External design: External design consists of conceiving, planning out and specifying the externally observable characteristics of the software product. These characteristics include user displays or user interface forms and the report formats, external data sources and the functional characteristics, performance requirements etc. External design begins during the analysis phase and continues into the design phase.
- Logical design: The logical design of a system pertains to an abstract representation of the data flows, inputs and outputs of the system. This is often conducted via modeling, which involves a simplistic (and sometimes graphical) representation of an actual system. In the context of systems design, modelling can undertake the following forms, including:
  - Data flow diagrams
  - Entity Relationship Diagrams
- Physical design: The physical design relates to the actual input and output processes of the system. This is laid down in terms of how data is input into a system, how it is verified/authenticated, how it is processed, and how it is displayed as output.

5.2 Design Notations

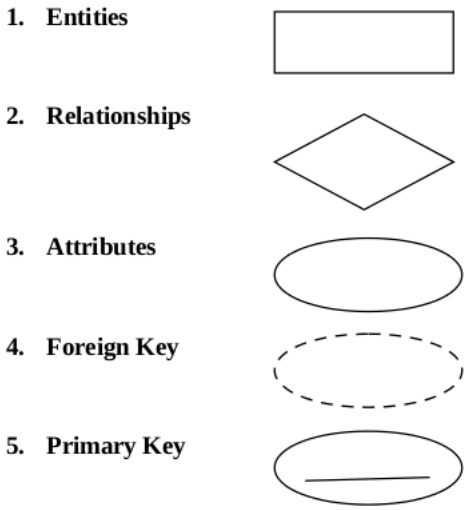
Data Flow diagrams:



Flow Charts:



Entity Relationship Diagrams:



5.3 Detailed Design

We basically describe the functionality of the system internally. The internal design describes how data is flowing from database to the user and how they both are internally connected. For this reason we can show the design of the system in detailed manner by many ways:

Flowchart A flowchart is a type of diagram that represents an algorithm or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. This diagrammatic representation can give a step-by-step solution to a given problem. Process operations are represented in these boxes, and arrows connecting them represent flow of control. Data flows are not typically represented in a flowchart, in contrast with data flow diagrams; rather, they are implied by the sequencing of operations. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields

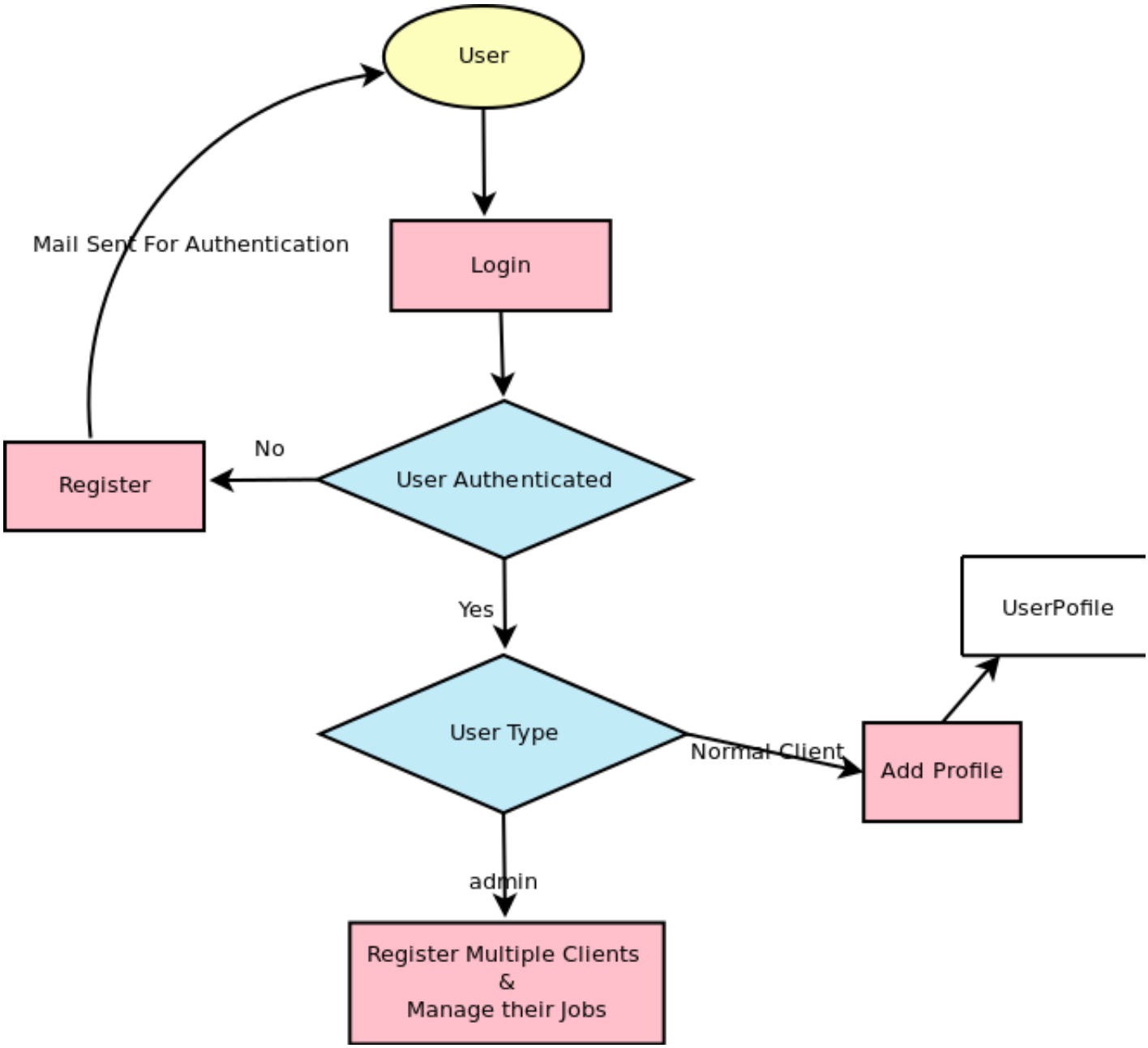


Figure 5.1: Flow Chart for Registeration

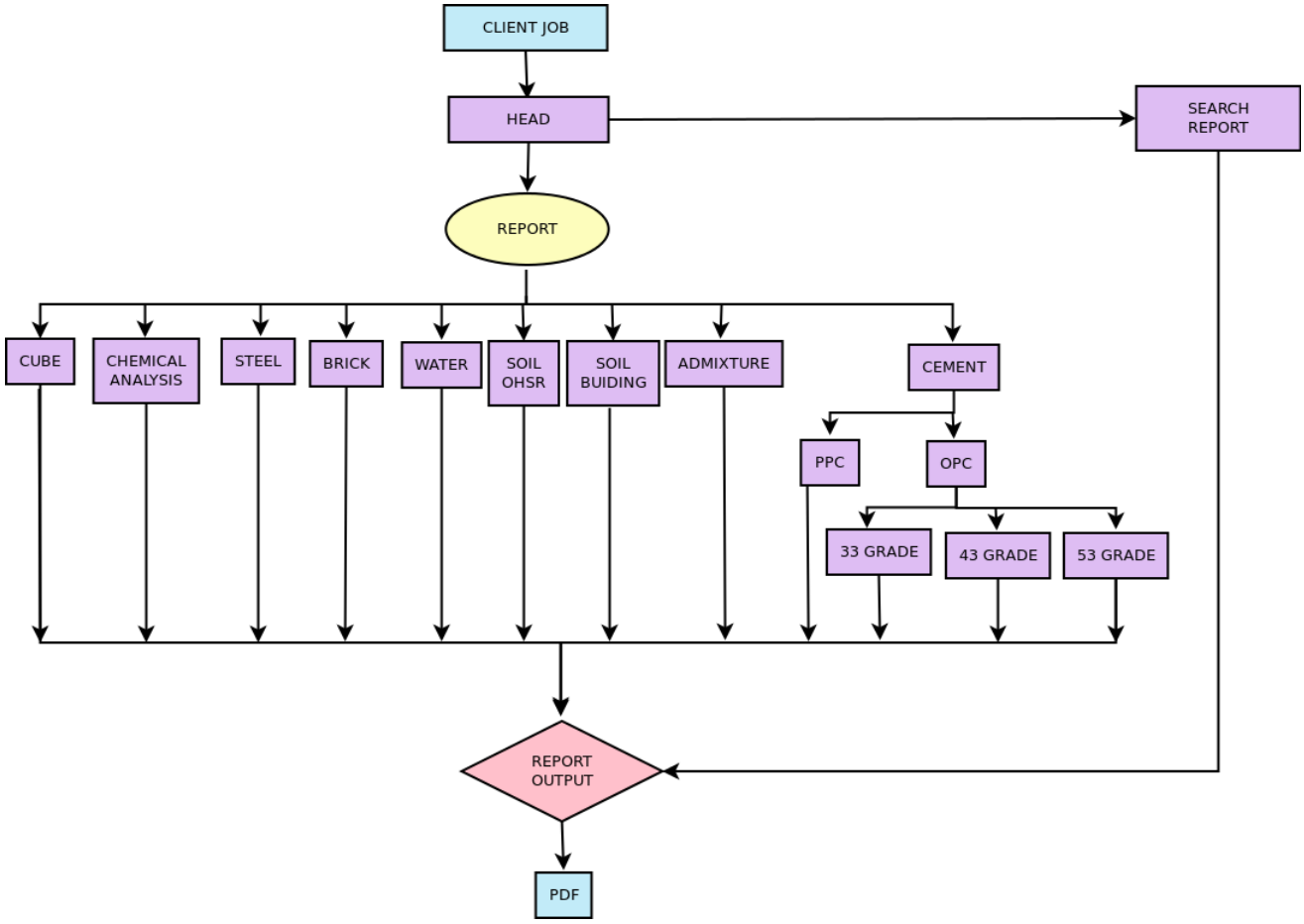


Figure 5.2: Flow Chart for Reports

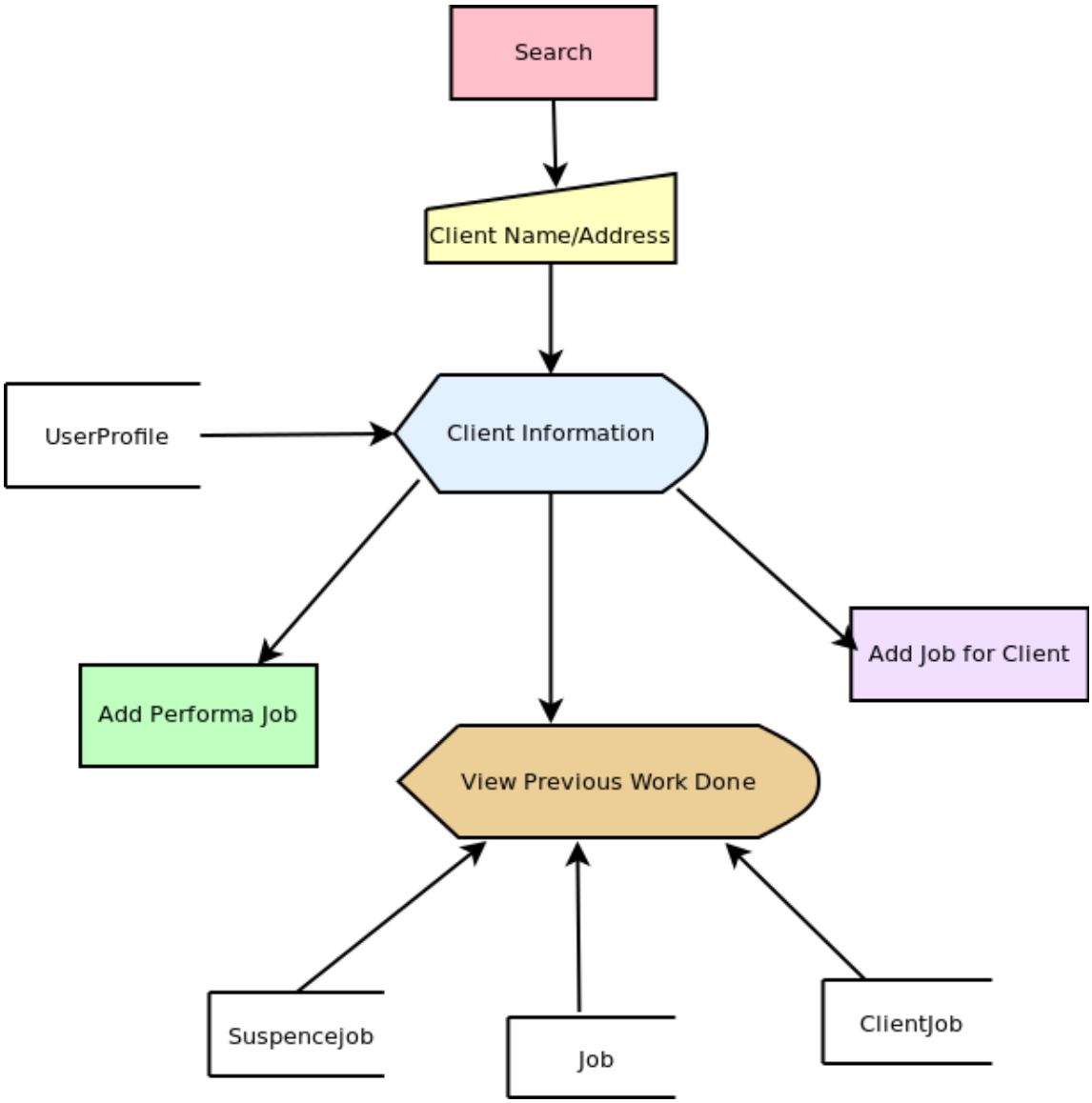


Figure 5.3: Flow Chart for Searching a Client

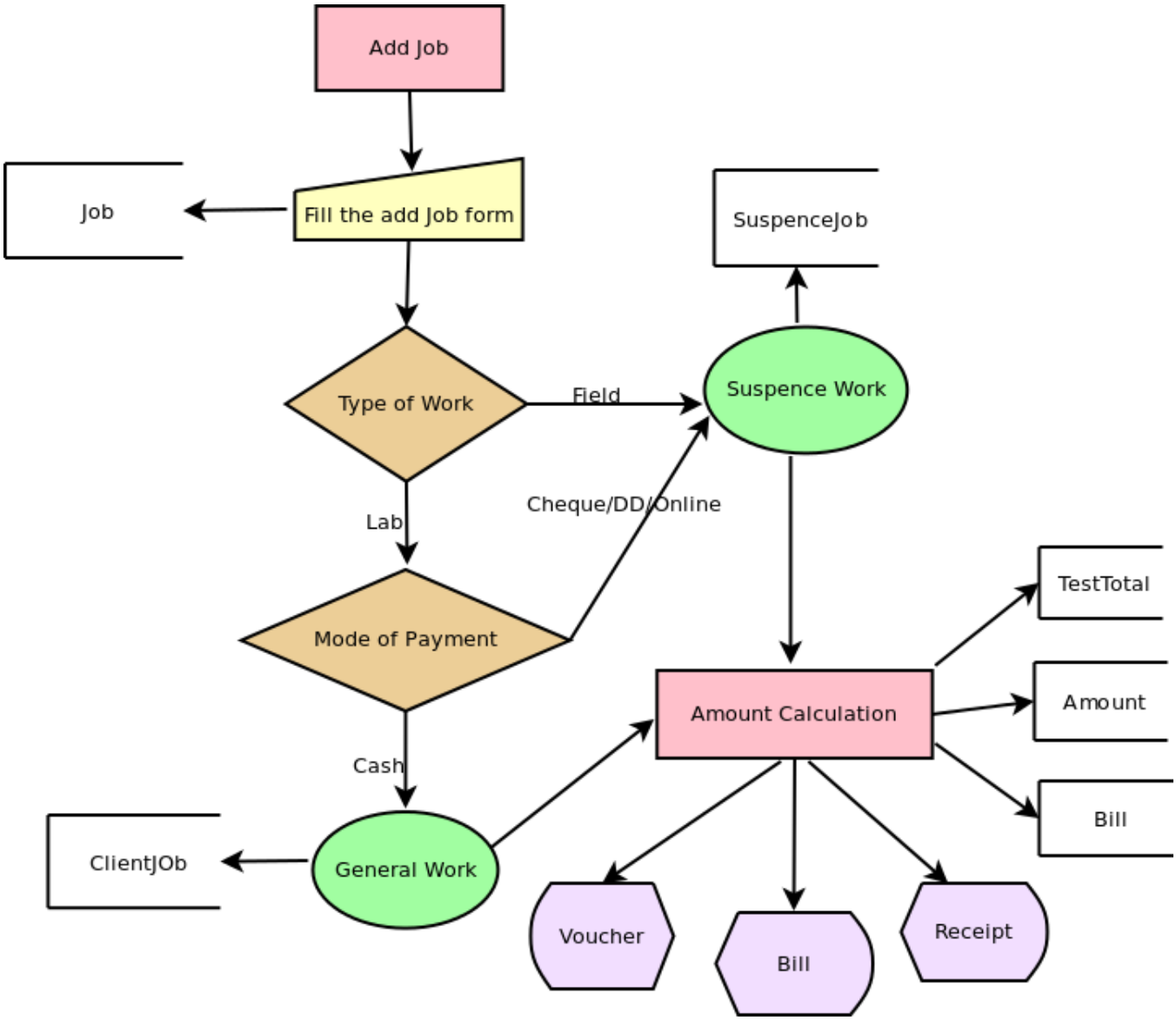


Figure 5.4: Flow Chart for adding a Job

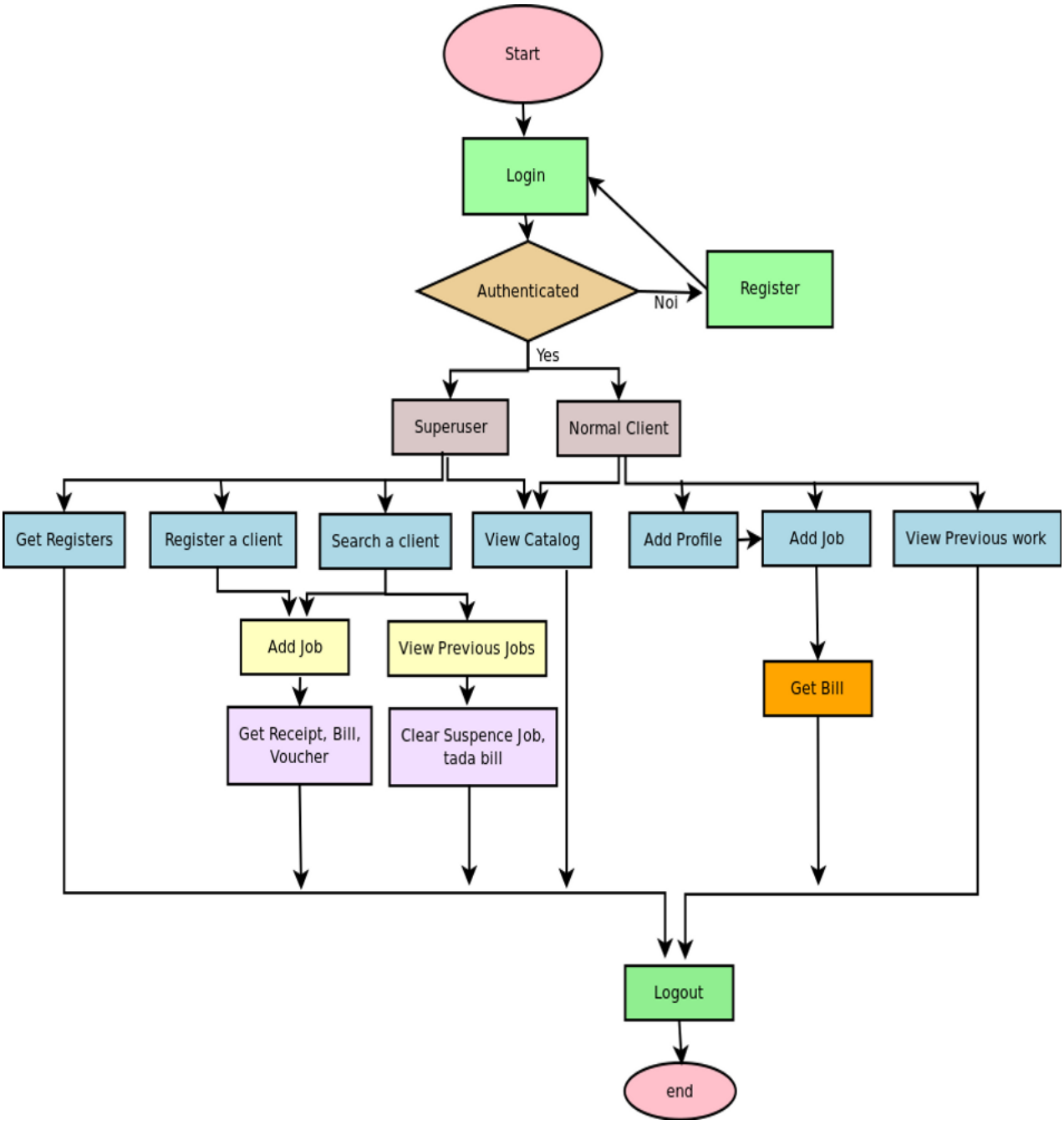


Figure 5.5: Flow Chart for software

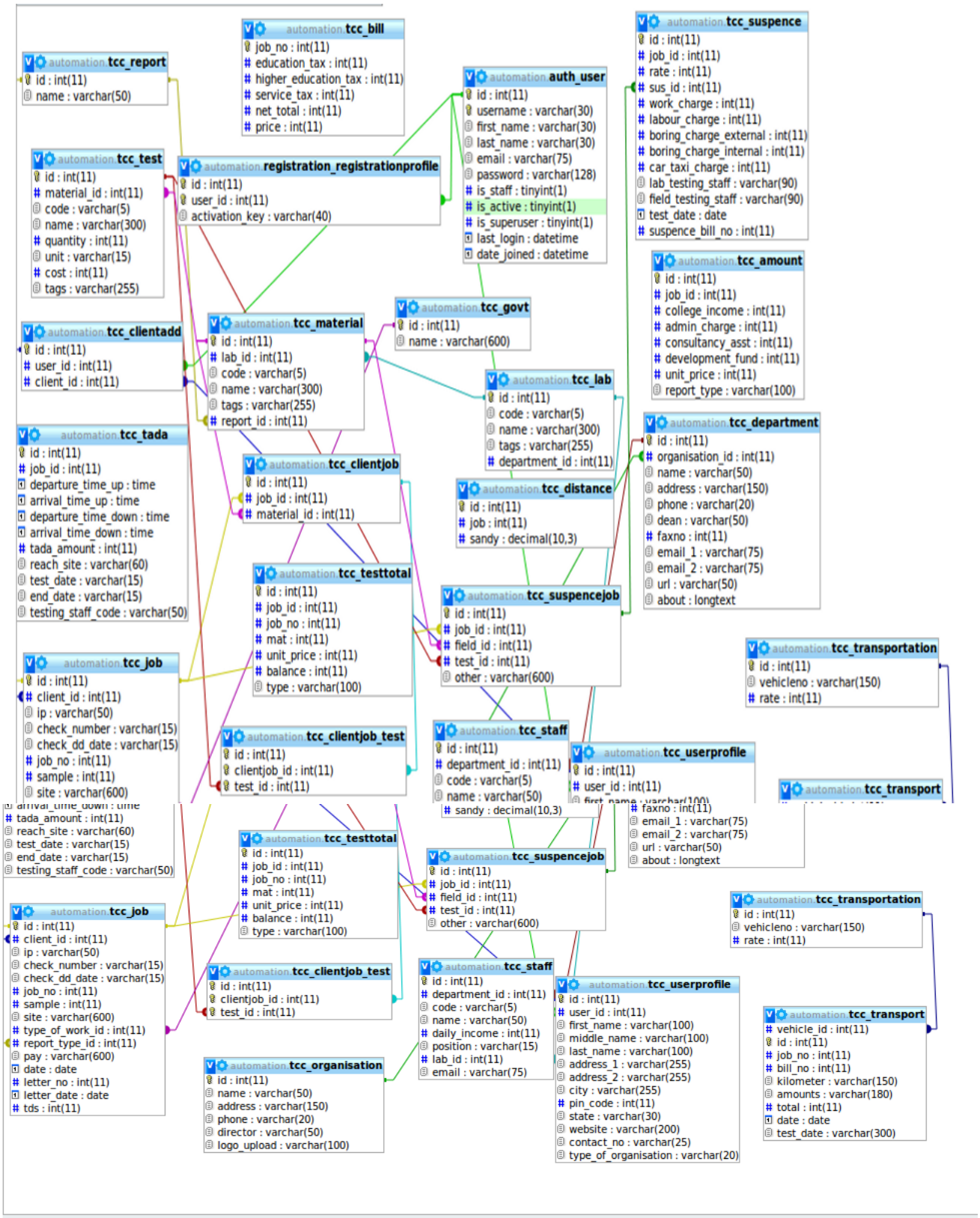


Figure 5.6: Database Design

CHAPTER 6

MY CONTRIBUTION

I have contributed following things in this project:

6.0.1 Surcharges

I made a Surcharge model to calculate taxes.Earlier there was no option to include taxes in Catalog. I made changes in admin.py, views.py and models.py.

6.0.2 TOTAL

I made an option to do total of all materials and calculate taxes on it. I made a view for it in views.py in Prints App.

6.0.3 Suspense App

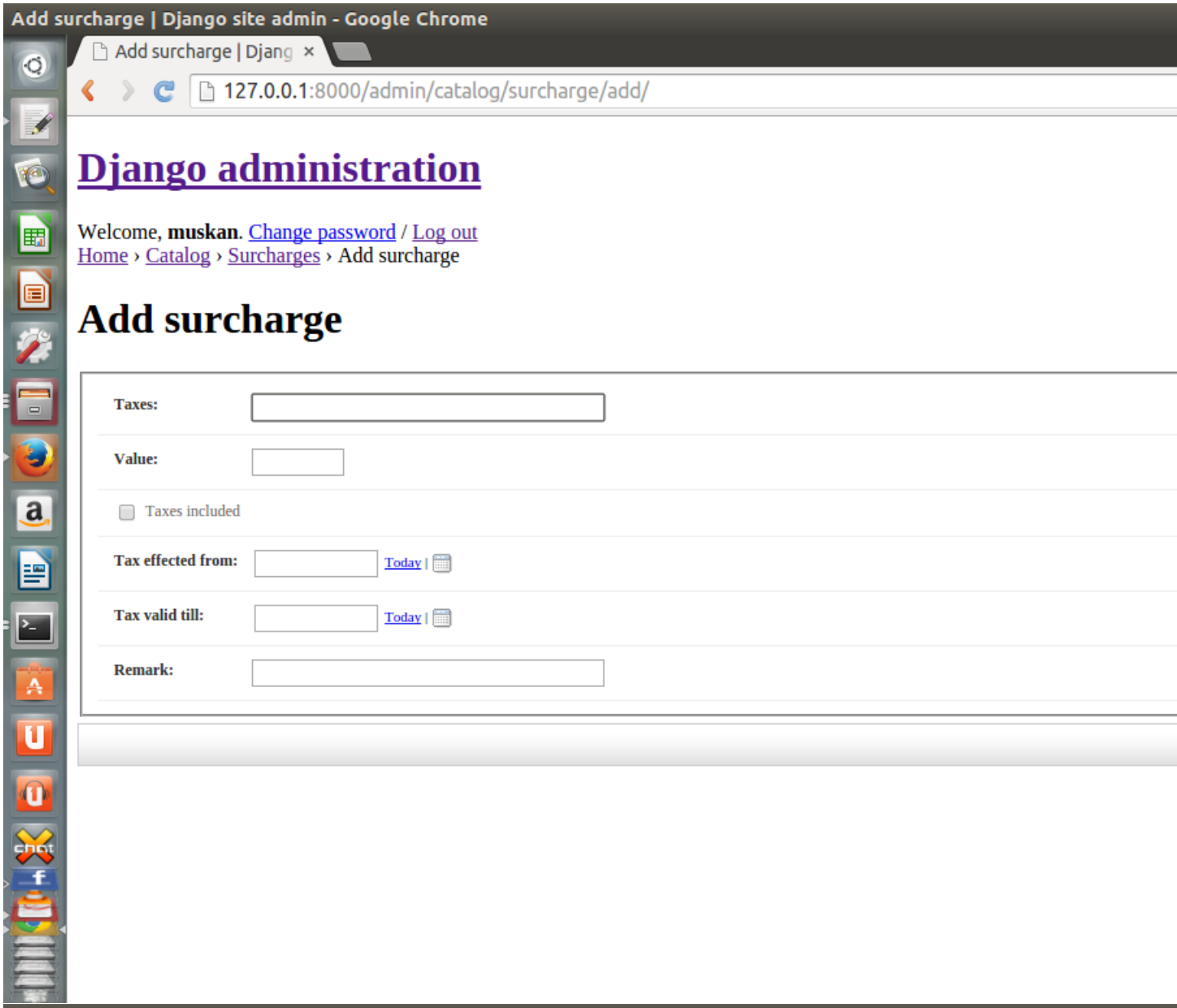
I and my team mate made Suspense app. We made views.py, forms.py, and templates for Suspense app.

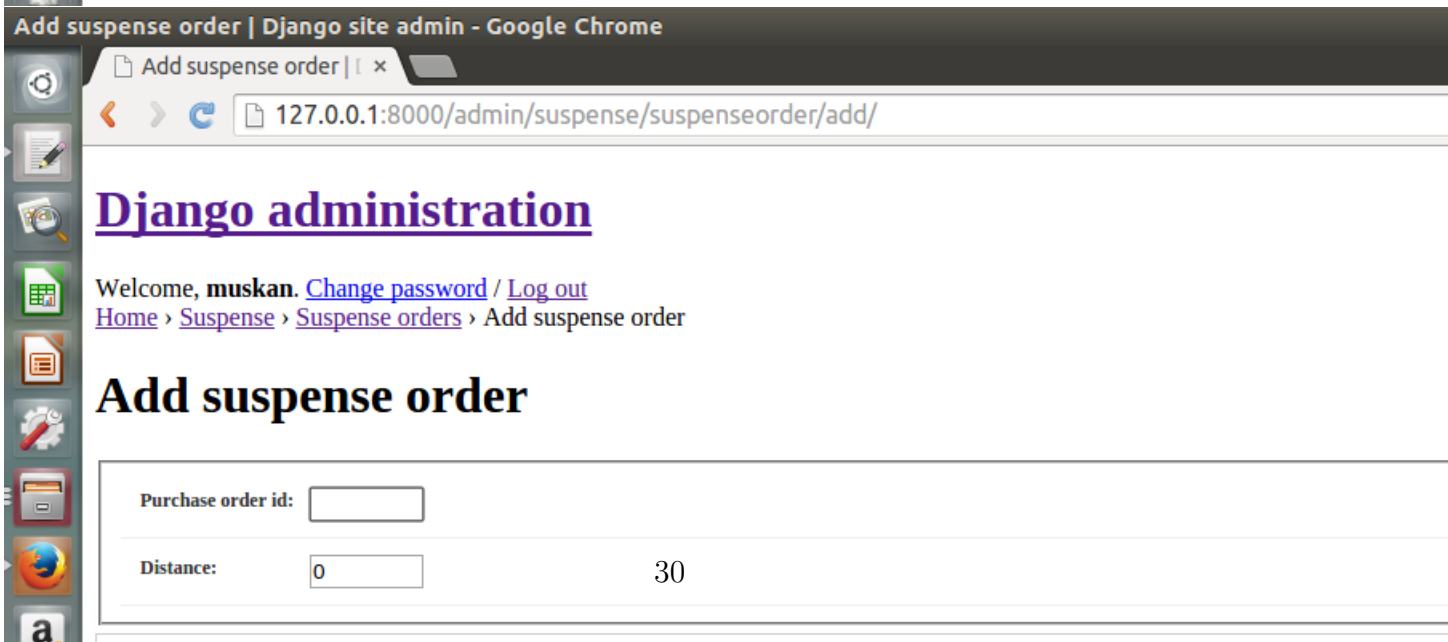
Role in LibreHatti Software: This 'Total' played a great role in Software as a software without generating total for each PurchaseOrder, it would have been of no use. Suspense App we made was of great use because It generates bill depending upon clients.

6.0.4 Future scope

There lies a great future scope in it as bill generation can be made linked (in my project it is static). There are various totalling techniques and algorithms which could be used and were studied:

6.0.5 Implementation





CHAPTER 7

IMPLEMENTATION

Implementation is the process of converting a new or revised system design into an operational one. At the present time there is no system as Imperial Finance which work online and provide information via web. So this is the replacement of the manual financial system. In Imperial Finance most of the finance related task will be performed online.

7.1 Types of Implementation

- Implementation of a computer system to replace a manual system.
- Implementation of a new computer system to replace an existing one.
- Implementation of a modified application to replace an existing one.

7.2 Aspects of Implementation

- Conversion
- Post Implementation and review
- Software maintenance

7.3 Implementation of the Project

Librehatti Software is the implementation of the with the new one. The current software is offline without any registration module thus making the management of clients and there data difficult. There is no search module. Thus when there is a need to search a client or a job, the employee need to go to the backend and see the database.

This process is very time consuming and irritating. The project implementation of Imperial Finance starts with the Administrator. Administrator will be the super user of the application who will configure system information such as new services, lab, employees and new clients. There

will be a different interface for the employees and clients from where they can manage and view the TCC related information which they allowed to view.

It is a web based application, so it is distributed and data centric. In this application, MySQL database is used to store data related to employees, users offered by system, clients, etc. Since database is on Server, so any number of users can work simultaneously and can share their data with each other.

7.4 Conversion Plan

Conversion is the process of changing from one system to another. This plan involves:

- Creating computer-compatible files.
- Training the operating staff.
- Installing terminals and hardware.

7.5 Conversion Processes

- File Conversion.
- Data Entry.
- User Training.

7.6 Elements of User training

- The initial training period.
- At the time of Installation.
- If required, during Maintenance Phase.

7.7 Post-Implementation and Software Maintenance

Implementation review is an evaluation of a system in terms of the extent to which the system accomplishes stated objectives and actual project costs exceeds initial estimates.

7.8 Review Plan

An overall plan covers following aspects:

- Administrative plan.
- Personnel requirements plan.
- Hardware plan.

- Documentation review plan.

After the implementation of this project, the team will see the post implementation phase. If there will be any concerns, those will be solved based on the user feedback.

7.9 Maintenance

In order for a software system to remain useful in its environment it may be necessary to carry out a wide range of maintenance activities upon it. There are bugs to fix, enhancement to add and optimization to make, changes has to be done in older version to make it application for current use of current version to cater the need of future. Maintenance can be of three types:

- **Corrective Maintenance**: Changes necessitated by actual errors (defects or residual "bugs") in a system are termed corrective maintenance. These defects manifest themselves when the system does not operate as it was designed or advertised to do. A defect or bug can result from design errors, logic errors and coding errors. Design errors occur when for example changes made to the software are incorrect, incomplete, wrongly communicated or the change request misunderstood. In the event of a system failure due to an error, actions are taken to restore operation of the software system. The approach here is to locate the original specifications in order to determine what the system was originally designed to do.
- **Adaptive Maintenance**: Any effort that is initiated as a result of changes in the environment in which a software system must operate is termed adaptive change. Adaptive change is a change driven by the need to accommodate modifications in the environment of the software system, without which the system would become increasingly less useful until it became obsolete. The term environment in this context refers to all the conditions and influences which act from outside upon the system, for example business rules, government policies, work patterns, software and hardware operating platforms. A change to the whole or part of this environment will warrant a corresponding modification of the software.
- **Perfective Maintenance**: This is actually the most common type of maintenance encompassing enhancements both to the function and the efficiency of the code and includes all changes, insertions, deletions, modifications, extensions, and enhancements made to a system to meet the evolving and/or expanding needs of the user. A successful piece of software tends to be subjected to a succession of changes resulting in an increase in its requirements. This is based on the premise that as the software becomes useful, the users tend to experiment with new cases beyond the scope for which it was initially developed. Expansion in requirements can take the form of enhancement of existing system functionality or improvement in computational efficiency. Though efforts have been made to develop error free systems, but no system is perfect, room for improvement is always there. Thus proper documentation for the system has been done so that it will be easy to handle any breakdown or any other type of system maintenance activity.

CHAPTER 8

TESTING

8.1 Project Testing

Project testing is an investigation conducted to determine the quality of the project and the services provided by the project. Testing is the process of analyzing a project to detect the differences between existing and required conditions (that is defects/errors/bugs) and to evaluate the features of the project. After complete development of the project it is mandatory to test the project. The main motive of the project testing is to identify whether project is able to meet user requirements or not. To know the better performance of project we have to develop various Test Cases. Now, designing good test cases is a complex art. The complexity comes from three sources:

- Test cases help us discover information. Different types of tests are more effective for different classes of information.
- Test cases can be good in a variety of ways. No test case will be good in all of them.
- Our tend to create test cases according to certain testing styles, such as domain testing or risk-based testing. Good domain tests are different from good risk-based tests.

CHAPTER 9

PROJECT LEGACY

9.1 Technical and Managerial Lesson Learnt

I learned a lot by doing this project . During the six weeks period I got to learn a vast number of technologies. These are lsited below :

- **Operating system**: Ubuntu
- **Languages used**: Python, Html, CSS, JavaScript, PHP, Bash Scripting
- **Framework**: Django
- **Database**: MySql
- **Typesetting**: LaTex
- **Documenter**: Doxygen
- **Code Maintainance**: Github

So during this project I learned all the above things. Above all I got to know how Softwares are developed from the scratch. Planning, designing, developing code, working in a team, testing etc. These are all very precious things I got to learn during the training period If I talk about the project, LibreHatti project reduce lot of manual work. It has automated all the office work of TCC.

9.2 Current status

LibreHatti software is currently introduced in Testing and Consultancy Cell of our college and also on the experimental server of our college. It has automated all the manual work of TCC. Software has following applications in it:

- Login and registration
- Register new client.

- Search the client and add jobs for him or see the status.
- Get different records of jobs based on type of work, type of report, payment type, type of lab etc.
- Amounts get automatically summed up taking in account the sevice charges, income tax, sevice tax, education cess etc.
- Online management.
- As the database server is online so multiple clients can work on it.
- Catalog feature.
- Bill Generation feature

9.3 Future Scope

Librehatti reduces the manual work and save the money. It also reduces the man power and reduces the burden of handling lots of data. It keeps the backup of the record stored. As the project is complete but still there are many more things or areas which can be added to the project to make that more reliable. These remaining areas may be:

- Recieve the payment online through e-billing.
- Managing the labs work through software, thus when there is any job that is to be done in a lab, they get email automatically.
- Making it work like an ERP system i.e merge connect other departments also with, thus making it a big one.
- SMS Service: When the work of a client is complete, the client and the employee should automaticlly receive a message regarding this.
- Report Fax: There may be an option through which the reports will be automatically faxed to the Clients/Employee.

CHAPTER 10

OTHER TASKS

There were many other tasks that I performed during my training period. One of task was to build another website using a template(taken from Internet) and other was writing a blog.

Here is a link to my Daily Diary Blog : http://muskana912.wordpress.com/

10.0.1 Aim Of Blogging

Blogging is quite a trend from a few years ago. These days writing blogs has become hobby. People write blogs for sharing their work, experience, save others time for doing the same work and for their Professional Resume. Companies and product owners give their ads on different sites. There are many sites that provide facility to create our own blogs and easily customize them. Blogging makes a person better thinker and writer, increases vocabulary and english grammer. It increases confidence in yourself. I wrote two blogs : One for earning and one as a daily diary. Wordpress blog was used a daily diary by me in training. This let me knew at the end of day what I actually do whole day. Other Blog I have is on Blogspot, which I wish to get approved by adsense in november. It's llnk is : http://techystuffcse.blogspot.in/

- I learnt Google Docs and using Linux Operating System.
- Other thing I did was I attended many seminars which used to held at TCC. The best one was on '3-D printers' by Satyam Malhotra .

10.0.2 Reporting

I made 2-3 reports also on various seminars. One was on Entrepreneurship by Harman and Vigas.

- I learnt HTML and Python.

10.0.3 What is HTML

HyperText Markup Language (HTML) is the main markup language for creating web pages and other information that can be displayed in a web browser.

HTML is written in the form of HTML elements consisting of tags enclosed in angle brackets (like <html>), within the web page content. HTML tags most commonly come in pairs like

<h1> and </h1>, although some tags represent empty elements and so are unpaired, for example <img>. The first tag in a pair is the start tag, and the second tag is the end tag (they are also called opening tags and closing tags). In between these tags web designers can add text, further tags, comments and other types of text-based content.

The purpose of a web browser is to read HTML documents and compose them into visible or audible web pages. The browser does not display the HTML tags, but uses the tags to interpret the content of the page.

HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items. It can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages.

BIBLIOGRAPHY

[1] The Django book, http://www.djangobook.com/en/2.0/index.html

[2] Balagurusamy, E. New Delhi:Object Oriented Programming with C++. Fourth Edition. The McGraw-Hill Companies, 2008

[3] Django demo project, https://docs.djangoproject.com/en/dev/intro/tutorial01/

[4] Python, http://www.tutorialspoint.com/python/, http://docs.python.org/2/tutorial/