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| Electric Supply Customer Management System |
| Synopsis |
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Table of Contents

[1. Introduction 2](#_Toc320368080)

[1.1 Background 2](#_Toc320368081)

[1.2 Objective 2](#_Toc320368082)

[1.3 Purpose and Scope 3](#_Toc320368083)

[1.3.1 Purpose 3](#_Toc320368084)

[1.3.2 Scope 4](#_Toc320368085)

[2. SURVEY OF TECHNOLOGY 4](#_Toc320368086)

[Programming FRAMEWORK (.NET 4) 5](#_Toc320368087)

[Programming Language (C#) 5](#_Toc320368088)

[Database - MySQL 5](#_Toc320368089)

[3. REQUIREMENTS AND ANALYSIS 6](#_Toc320368090)

[3.1 Problem Definition 6](#_Toc320368091)

[3.1.1 Existing System 6](#_Toc320368092)

[3.1.2 Documents maintained 7](#_Toc320368093)

[3.1.3 Work To Be Done 8](#_Toc320368094)

[3.2 Requirements Specification 8](#_Toc320368095)

[3.2.1 Functional Requirements 8](#_Toc320368096)

[3.2.2 Non-Functional Requirements 11](#_Toc320368097)

[3.3 Planning and Scheduling 11](#_Toc320368098)

[Gantt chart 11](#_Toc320368099)

[Tracking Gantt 12](#_Toc320368100)

[Pert chart (Network Diagram) 12](#_Toc320368101)

[3.4 Hardware and Software Requirements 13](#_Toc320368102)

[3.4.1 Hardware Requirements 13](#_Toc320368103)

[3.4.2 Software Requirements 13](#_Toc320368104)

[3.5 PRELIMINARY PRODUCT DESCRIPTION 14](#_Toc320368105)

[3.6 CONCEPTUAL MODELS 15](#_Toc320368106)

[3.6.1 E-R Diagram 15](#_Toc320368107)

[3.6.2 Context Diagram 18](#_Toc320368108)

[3.6.3 Data Flow Diagram 18](#_Toc320368109)

[4. REFERENCES 19](#_Toc320368110)

# Introduction

## Background

Electricity is the ultimate need for almost every citizen of our country. With the advent of new technology we are more dependent on electricity now. Currently the electric supply offices use paper books and ledgers to track & manage customer applications, complaints. As a result, it takes longer time and extra effort to serve customers with existing inefficient system. Electric Supply Customer Management System (will be referred as **ESCMS** in this document) is a computerized solution for managing customer needs in Electric Supply offices. Electric Supply Customer Management System will enable electric supply offices to maintain computerized records and manage customer needs more efficiently with help of sophisticated customer management techniques and technologies.

## Objective

The main objective of this project is to automate the process in an Electric Supply office. Electric Supply Customer Management System will be used by Electric Supply Employees to enter various data about the Customers and their needs. The Employees will update the status of customer requests; track the progress of the work & transactions made in Electric Supply Customer Management System. It can generate reports and receipts required to serve customer request and queries. In a nutshell **ESCMS** will be the backbone of an Electric Supply office and it will be a next generation solution for better customer service and customer satisfaction.

## Purpose and Scope

### Purpose

The purpose of the project is to computerize the workflow of an Electric supply office. The below mentioned diagram shows the existing Customer Management System of Electric Supply offices which will be completely computerized with the help of this software.



The main advantages of Electric Supply Customer Management System over existing traditional paper book and ledger system are given below:

1. It is faster as the computer is doing the searching and fetching of data.

2. It is more efficient as it reduces the need of more employees.

3. It is more accurate.

4. It can generate paper report and main ledgers to help transition from older system.

5. It can store the data in a centralized server so that data will available to use anywhere. So the auditing of the data can be done without physically being present to the site.

### Scope

Currently this software is aimed for a single electric supply office customer management. It can be extended to support networked multiple electric supply office and have a centralized database and to serve wider range of customers of Electric Supply around the country.

We have developed this for Desktop Computers running on Windows Operating System. It can be enhanced to support UNIX / Linux, MAC OSX Operating systems.

Our software will not be integrated with Electric Billing System right now. But in future we can easily extend to support that.

# SURVEY OF TECHNOLOGY

This software will follow Object Oriented Programming Paradigm and use below mentioned areas.

**Front End/ GUI Tools**: Visual Studio 2010, .NET 4.0, C#

**Backend:** MySQL

**Networking Technologies:** TCP/IP

**Operating Systems:** Windows XP, Windows 7

**Application Type:** ERP application, Database Management System.

## Programming FRAMEWORK (.NET 4)

The .NET 4 Framework is Microsoft's platform for building applications that have visually stunning user experiences, seamless and secure communication, and the ability to model a range of business processes. The .Net Framework consists of:

**Common Language Runtime** – provides an abstraction layer over the operating system

**Base Class Libraries** – pre-built code for common low-level programming tasks

**Development frameworks & technologies** – reusable, customizable solutions for larger programming tasks.

The framework's Base Class provides user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications. The class library is used by programmers, who combine it with their own code to produce applications.

## Programming Language (C#)

C# is a type-safe, object-oriented language that is simple yet powerful, allowing programmers to build a breadth of applications.

C# is a multi-paradigm programming language encompassing imperative, declarative, functional, generic, object-oriented (class-based), and component-oriented programming disciplines.

It was developed by Microsoft within the .NET initiative and later approved as a standard by Ecma (ECMA-334) and ISO (ISO/IEC 23270). C# is one of the programming languages designed for the Common Language Infrastructure.

C# is intended to be a simple, modern, general-purpose, object-oriented programming language.

## Database - MySQL

MySQL is the world's most popular open source database software, with over 100 million copies of its software downloaded or distributed throughout its history.

The MySQL Community Edition includes:

* Pluggable Storage Engine Architecture
* **Multiple Storage Engines**: InnoDB , MyISAM, NDB (MySQL Cluster),Memory ,Merge , Archive, CSV
* MySQL Replication to improve application performance and scalability
* MySQL Partitioning to improve performance and management of large database applications
* Stored Procedures to improve developer productivity

Electric Supply Customer Management System

# REQUIREMENTS AND ANALYSIS

## Problem Definition

### Existing System

The existing system is traditional paper books and ledger system where several registers are maintained to store user request and to track other details about the request. The flow diagram of how a customer request executed now is shown below:



### Documents maintained

**Application Register:** Application Number, Name, Address with Contact Number, Load, Initial

Deposit Amount, Application Received Date, Quotation Amount, Quotation Sent Date, Amount

Received On, Service Connection Number.



* **Service Connection Register:** Service Connection Number, Application Number, Name, Address with Contact Number, Quotation Amount, Amount Received Date, Work Assigned To (Contractor), Work Completed on Date.
* **Meter Movement Register:** Service Connection Number, Name Address with Contact Number, Meter Number, Seal Number, Meter Issue Date, Work Assigned To (Staff), Date of Connection
* **Estimation Sheet per Application:** contains input Application Number, name, Address with Contact Number, Wire Length Required, Angle Type and calculates Weight of Angle, and Quotation amount

### Work To Be Done

We will incorporate the above mentioned workflow of an Electric Supply Customer Management System in an automatic computerized way.

## Requirements Specification

### Functional Requirements

#### Apply for new connection

**Introduction**

Customer can apply for a new connection.

**Inputs**

Relevant customer data like name, address, contact number, type, payment.

**Processing**

Employee will enter the data in the ESCMS and create a new connection entry.

**Outputs**

ESCMS will generate an application number for future reference and will provide customer a acknowledgement receipt.

#### check connection request status

**Introduction**

Customer can check the new connection status.

**Inputs**

Application number & customer name.

**Processing**

Employee will enter application number & customer name in the ESCMS and it will search the status & display in the screen.

**Outputs**

Customer will get the status information from employee and he may request for a printed status also.

#### Create a vendor task

**Introduction**

Employee will create a task for vendor.

**Inputs**

Application number, customer details, task details.

**Processing**

Employee will enter details in the ESCMS and it will pick a vendor & assign the task.

**Outputs**

Vendor will get a notification about the task and a printed work order.

#### vendor task status update

**Introduction**

Vendor will update the task status to employee and receive partial payment.

**Inputs**

Application number, task details, proof of task status.

**Processing**

Employee will enter details in the ESCMS and update the system. System will approve the payment order.

**Outputs**

Vendor will get a notification about the task update and a printed payment order.

#### Generate report

**Introduction**

Employee will choose the kind report to be printed and system will create the details of the report and print it.

**Inputs**

Report Type, area, time frame.

**Processing**

Employee will enter details in the ESCMS and the system will collate data. System will print the report.

**Outputs**

A printed report will generated.

### Non-Functional Requirements

* **Efficiency**:

It will be efficient as it reduces manual labor and searching.

* **Backup**:

The employees will take regular print out of daily reports and take back up. Digital back up can be taken in a regular interval.

* **Documentation**:

ESCMS will have user manual and help documents.

* **Maintainability**:

It is designed such a way that it can be maintained with minimal effort.

* **Performance**:

The response time of ESCMS will be very fast. So it will be efficient enough to cater the customer.

* **Privacy**:

The data will be encrypted and the user data will not be shared with third party.

* **Security**:

ESCMS will use secure connection and enhanced security measures to protect data.

* **Usability**:

It will be very user friendly and usable by any person with minimal computer knowledge.

## Planning and Scheduling

### Gantt chart



### Tracking Gantt



### Pert chart (Network Diagram)



## Hardware and Software Requirements

### Hardware Requirements

* Computer that has a 1.6GHz or faster processor
* 1 GB (32 Bit) or 2 GB (64 Bit) RAM
* 10 MB of available hard disk space
* DVD-ROM Drive / USB Port

### Software Requirements

* Windows XP (x86) with Service Pack 3 / Windows Vista (x86 & x64) with
* Service Pack 2 / Windows 7 (x86 & x64)
* Microsoft .NET 4.0

## PRELIMINARY PRODUCT DESCRIPTION

Electric Supply Customer Management System will upgrade the existing system, so it needs to have good support for existing system as well. It will collect the data from customers & employees and populate records which will match existing paper book registers. So that employees can take print out and maintain similar records. Electric Supply Customer Management System consists of three main modules:

* ESCMS GUI
* ESCMS Engine
* ESCMS Database



## CONCEPTUAL MODELS

### E-R Diagram

We will design a RDBMS for File Management System. The entities and their attributes are listed below. Attributes in Bold letter is the unique key.



**Relationship between Entities:**

Electric Supply office has Customers 1 : N

Electric Supply office has Contractors 1 : N

Electric Supply office has Employees 1 : N

Customer does Requests 1 : N

Electric Supply serves Requests 1 : N

User uses Service Connection 1 : N

Employees provides Estimates M : N





### Context Diagram



### Data Flow Diagram



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