




# Masters (MIT) Project Final Report

## March 2018

Please tick relevant Stream	
MIT(General) : MIT3101	V
MIT(e-Learning) : MIT3111	
MIT(Multimedia) : MIT3121	

For MIT(General) Projects only	
Research Project	
Implementation Project	V

<b>Project Title</b>	Human Capital Information System for Senaka Group of Companies
<b>Student Name</b>	D.S.D.Ariyapala
<b>Registration No.</b>	2015/MIT/003
<b>Index No.</b>	15550032
<b>Supervisor's Name</b>	Dr. K.L.Jayarathne

For Office Use ONLY



# **Human Capital Information System for Senaka Group of Companies**

**A dissertation submitted for the Degree of Master of  
Information Technology**

**D.S.D.Ariyapala**

**University of Colombo School of Computing**

**2018**



## Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

Student Name: D S D Ariyapala

Registration Number: 2015/MIT/003

Index Number: 15550032

---

Signature:

Date:

This is to certify that this thesis is based on the work of

Mr./Ms.

Under my supervision the thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by:

Supervisor Name: Dr. K.L.Jayarathne

---

Signature:

Date:

## **Abstract**

Employees are the backbone of any company. Therefore their management plays a major role in deciding the success of an organization.

Manual record keeping is not a worth way of managing reliable details of an organization. But the Human Capital Information System makes it easy for the employer to keep track of all records. This application allows the administrator to manage employee details in efficient way. Each employee in the database is associated with a position can be added and edited when need arises. Most of all, the employer can assess their progress in order to keep track of employee performance.

As Human Capital Information System is a web based system, it is flexible and easy to use and able to manage the crucial organization asset (people). It is simple to understand and can be used by anyone who is not even familiar with simple employees system. It is user friendly and just asks the user to follow step by step operations by giving easy to follow options. It is fast and can perform many operations for a company. The combination of these modules into one application assures the perfect platform for re-engineering and aligning Human Resource processes along with the organizational goals. Human Capital Information System brings about an easy way of maintaining the details of employees working in any organization.

Laravel was selected as the framework which is free and open source php framework and intended for following the MVC architectural patterned. PHP language was selected as the server side scripting language and MYSQL was used to have database connection. XAMPP is free and open source cross platform which is basically runs local host or a local server and this gives suitable environment for testing MYSQL, PHP projects on the local computers.

The goal of this document is to provide solutions for the drawbacks of the current manual system and the performance added to the newly implemented web based application. It further describes the Background of the project, Requirements Gathering and Techniques, Design, Testing and Project Evaluation criteria.

## **Acknowledgements**

I would like to express my sincerest thanks to my supervisors Dr K.L.Jayaratne, Senior Lecturer, University of Colombo School of Computing for his ideas and suggestions and especially for their guidance through the difficulties encountered during the development of this project.

Special thanks to the Director of Senaka Group of Companies Mr.Senaka Gurusinghe, Director Operations Mr.Prageeth Dissanayake and All other most supportive staff members of Senaka Zenn (pvt) ltd who gave me a great strength for completing my project on time.

And also my heartiest gratitude to all my parents and my friends for the moral support throughout the whole project and encouraging me to do my best in the difficult times.

# Table of Contents

Declaration.....	ii
Abstract.....	iii
Acknowledgements .....	iv
Table of Contents .....	v
List of Figures.....	viii
List of Tables .....	ix
List of Abbreviations .....	x
Chapter 1: INTRODUCTION .....	1
1.1 The Problem Statement.....	1
1.2 Motivation.....	2
1.3 Objectives .....	2
1.4 Scope.....	3
Chapter 2: BACKGROUND .....	4
2.1 Background Information.....	4
2.2 Review of Similar Systems .....	5
Chapter 3: ANALYSIS AND DESIGN .....	7
3.1 Analysis .....	7
3.1.1 Requirement Analysis .....	7
3.1.2 High Level Diagrams of Analysis .....	9
3.2 Design .....	14
3.2.1 Methodological Approach .....	14
3.2.2 Software Architecture.....	16
3.2.3 Database Design .....	17
3.2.4 High Level UML Design Diagrams .....	21
3.2.5 User Interface Design .....	25
Chapter 4: IMPLEMENTATION.....	32
4.1 Implementation Technology .....	32
4.2 Software Requirements .....	33
4.3 Hardware Requirements .....	33
Chapter 5: EVALUATION & TESTING.....	34
5.1 Evaluation .....	34
5.1.1 Sampling of Subject .....	34

5.1.2	Evaluation Scenarios .....	34
5.1.3	Tools .....	34
5.1.4	Data Analyzing .....	35
5.2	Testing .....	39
5.3	Test Plan .....	40
5.3.1	Test Cases .....	40
5.3.2	Test results .....	40
Chapter 6: CONCLUSION AND FUTURE WORK .....		41
6.1	Conclusion .....	41
6.2	Future Developments .....	43
References .....		44
Appendices .....		45

## List of Appendices

Appendix A: User Manual .....	45
Appendix B: User Evaluation .....	53
Appendix C: Test Cases.....	56
Appendix D : Use case Narratives .....	58



## List of Figures

Figure 1 : Use Case Diagram for Administration Role .....	10
Figure 2 : Use Case Diagram for Manager Role .....	11
Figure 3 : Use Case Diagram for Employee Role .....	12
Figure 4 : Waterfall Model .....	15
Figure 5 : Software Architecture Diagram for Human Capital Information System .....	16
Figure 6 : The Entity-Relationship (ER) Diagram .....	18
Figure 7 : Normalization for Human Capital Information System.....	19
Figure 8 : Physical Database Design for Human Capital Information System .....	20
Figure 9 : Class Diagram for Human Capital Information System .....	21
Figure 10 : Sequence Diagram for Login process .....	22
Figure 11 : Sequence diagram for add new user .....	23
Figure 12 : Sequence diagram for Sending SMS and Emails.....	24
Figure 13 : User Interface - Login page .....	25
Figure 14 : User interface - Display the number of users in the system.....	25
Figure 15 : User Interface - Home page with the extraction of subsidiaries company list .....	26
Figure 16 : User Interface - Home page with the extraction of contact ways .....	26
Figure 17 : User Interface - List of registered users .....	27
Figure 18 : User Interface - User details .....	27
Figure 19 : User Interface - View Employee Details .....	28
Figure 20 : User Interface - Job Category .....	29
Figure 21 : User Interface - Sending SMS .....	30
Figure 22 : User Interface - Sending email .....	30
Figure 23 : User Interface - Print report .....	31
Figure 24 : User Interface - Message box .....	31
Figure 25 : Bar Chart - Overall satisfaction .....	36
Figure 26 : Pie Chart - Overall understanding.....	36
Figure 27 : Horizontal Bar Chart - User friendliness .....	37
Figure 28 : Pie Chart - Understanding of the process.....	37
Figure 29 : Bar Chart - Visual appearance .....	38

## List of Tables

Table 1 : Use Case Narrative for Create User and Edit User .....	13
Table 2 : Software Requirements .....	33
Table 3 : Hardware Requirements .....	33
Table 4 : Test Result - Login Module .....	40
Table 5 : Test Result - Admin Module .....	56
Table 6 : Test Result - Employee Module .....	57
Table 7 : Use Case Narrative for Send SMS or email .....	58
Table 8 : Use Case Narrative for Delete user details.....	59
Table 9 : Use Case Narrative for Generate reports.....	60
Table 10 : Use Case Narrative for Search and View user details.....	61

## **List of Abbreviations**

CRM – Customer Relationship Management

CSS – Cascading Style Sheets

ERP – Enterprise Resource Planning

HCIS – Human Capital Information System

HOD – Head of Department

HR – Human Resource

HRIS – Human Resource Information System

HRMS – Human Resource Management System

HTML – Hypertext Markup Language

MVC – Model-View-Controller

OS – Operating System

PHP – Personal Home Page

SDLC - Systems Development Life Cycle

SMS – Short Message Service

SMTP – Simple Mail Transfer Protocol

SQL – Structured Query Language

WBS – Work Breakdown Structure

UML – Unified Modeling Language

# Chapter 1: INTRODUCTION

In this world of growing technologies everything has been computerized. With large number of work opportunities the Human workforce has increased. Thus there is a need of a system which can handle the data of such a large number of Employees. This project simplifies the task of maintaining employee records because of its user friendly nature.

Manual record keeping is not a reliable method as people tend to forget things. On the other hand keeping large amount of files and paper documents maintenance may cost a lot and it will not be efficient for a company with large amount of employee like this. Human Capital Information System was developed as a solution for a reliable recorder keeping to manage employee details in an accurate way.

## 1.1 The Problem Statement

Senaka Groups of Companies is currently managing the employee details manually. In such situations the company involved in the process of managing with its subsidiary companies(*Senaka Builders (Pvt) Limited, Senro Enterprises (Pvt) Limited, Senaka Cement Products (Pvt) Limited, Senaka Trading (Pvt) Limited, Senaka Zenn (Pvt) Limited*), such a way that to keep records regarding the employee details like; maintain and keep large amount of employee profiles manually separately, add employees, find employees, update employees etc [1].

Some Drawbacks of existing manual system:

- Need of large manual effort
- Employees cannot track their employment status
- Used to take much time to find any employee
- Manual system is not accurate
- Danger of losing the files in some cases
- Report generation is difficult
- Much complex working with a large no of data.

According to the mentioned current problems there should be a reliable way to manage the employee information. Human resource processes along with the organizational goals. This new system brings about an easy way of maintaining the details of employees working in any organization.

The aforementioned problems can be tackled by designing and implementing a web based HR management system (Human Capital Information System). This system will maintain employee information in a database by fully privacy and authority access. The project is aimed at setting up employee information system about the status of the employee, the educational background and the work experience in order to help monitor the performance of the employee through a password protected system. And the user friendliness of the system and asking the user to follow step by step operations by giving easy to follow options. Human Capital Information System is fast and can perform many operations for a company.

## **1.2 Motivation**

This system offers easy access to data as well as services such as managing employee details efficiently, timely report generation, monitoring employee status.

The employees are expected to have direct interaction with this system through a high integrity and security password protected user account and fully associated with the user authentication. The proposed system is web based to enable accessibility from any location as long as internet connectivity is available and direct interaction with the system will enable employee self-service and ability to incorporate newly available data.

In an organization without having an employee management system, it's a tedious job for the human resource department to keep track of each and every employee and even harder for a project manager to assign tasks to the project team. The Human Capital Information system is be developed to provide information of employees and many other facilities at the click of a button.

## **1.3 Objectives**

The main objective of this project is to provide a better platform for the management of employee information. And also less managing personnel and easy searching availability, sending useful notifications and user profile managing are major goals in this project. This will be done by designing and implementing a Human Capital Information System that will bring up a major paradigm shift in the way that employee information is handled.

The objectives of this system include:

- Maintenance of profile details of the employees separately according to the corresponding subsidiary companies, branches spread over wide geographical area and retrievals as and when required.
- Accessing information through the internet at any place in any time.
- Finding the vacancy situations and their priority /effect on the organizations performance.
- Employee pays report, service report management and makes a platform to help company's top level management to make decisions.
- Sending notifications via SMS or email to all employees in special occasions to notify if there are any news (Sending birthday wishes and other important detail).
- Well-designed database to store employee information.
- A user friendly front-end for the user to interact with the system.

## 1.4 Scope

To achieve the aims and the objectives of this project, the main things are to identify the main features that involved in the system. As this is a web based system anyone can access to the system at any time in any places with the internet connection. The employees who work in the organization will be able to get good understanding and the accurate employee details with the use of HCIS.

In this case there are main three types of users. They are the administrator (one of HR team) the manager and the employee. All these users should be able to login to the system with separate logins according to their authentication levels.

Administrator acts as the head of the system. He could be able to handle all the functions in the HCIS. Add users, edit users, delete users, generate reports, handle inquires are some of main functions of the system. The specialty of HCIS is that, system could be able to send SMS and emails to any users. And also various reports could be able to generate. All the details save under better securely and any unauthorized person cannot be able to drag any details without permission.

Human capital information system handles the employee details of the five subsidiary companies separately. Each company has a company manager who handles details within their companies. Once a manager needs to modify any details he should send an email as an inquiry to the administrator for requesting to modify details. And also managers will be able to send important SMS and emails once they needed.

Employees such as labors, drivers will be registered under administrator concern. Once a new employee joins to the company he will be registered to the system with the help of the relevant company manager. Manager will send an email to the administrator the details of new user and then the administrator will add the new user to the system.

A database is there to store the user details. This information can be retrieved by the users as per their privilege. Anyone can search any user using various searching categories. The employees are updated by the administrator immediately when needed. So there won't be unavailability problem regarding the searching criteria. And also HCIS has a SMS gateway to the web application to get the facility to send important messages and notifications to notify the employees via SMS. (Birthday wishes, Salary Details from payroll system, Attendance details, special announcements, etc.)

The proposed application will solve the problems they face now. This application will be designed such way that it will generate the necessary reports of the employees at any time. So there not much worries. This application allows administrative department also to collect accurate and comprehensive employee information. And also all these activities should be carried out by the system and the interfaces should be user friendly for the new users.

## **Chapter 2: BACKGROUND**

This chapter consists of the main background information, review of similar systems available related to Human Resource Management, Hardware and software technologies using to implement the new system and the alternative technologies available.

### **2.1 Background Information**

The management of the organization faced difficulties when handling large number of employee details manually. This system is expected to be user friendly and will offer easy access to data as well as services such as managing employee details efficiently, timely report generation, monitoring employee trainings and employee tracking.

The employee is expected to have direct interaction with this system through a password protected user account. Therefore proposed system is web based to enable accessibility from any location as long as internet connectivity is available. This direct interaction with the system will enable employee self-service.

Without an employee management system, it's a tedious job for the human resource department to keep track of each and every employee and even harder for a project manager to assign tasks to the project team. The Human Capital Information system will be developed to provide information of employees and many other facilities at the click of a button.

Some Major advantages of the system are,

- It's online, so that information is available anytime.
- High integrity and security.
- Ability to incorporate newly available data.
- It is user friendly
- Speed and accuracy is increased
- Fully automated.
- Security is associated with user authentication
- Duplication of information is curbed.

## **2.2 Review of Similar Systems**

This Human Capital Information System refers to the systems and processes at the intersection between human resource management (HRM) and information technology. It merges HRM as a discipline and in particular it's basic HR activities and processes with the information technology field whereas the programming of data processing systems evolved into standardized routines and packages of enterprise resource planning (ERP) software.

The benefits of automation are becoming widely known to HR and other areas of the business. The focus has shifted to automating as many transactions as possible to achieve effectiveness and efficiencies.

Human recourse is expected to relinquish its role as sole owner of HR information, so that managers and employees can use this information to solve their own problems using web-based systems. This HCIS will not necessarily mean reduction in HR staff. The HCIS will enable HR professionals to focus on transforming information into knowledge that can be used by the organization for decision making. It will be about HR and IT working together to leverage this technology.

Today there are many systems for managing employee details.

### **Apptivo**

Apptivo integrated suite of apps is used by businesses of all sizes, ranging from just one user to thousands. They support enjoy enhanced collaboration and communication with their customers. Designed to be intuitive and easy to use. Apptivo apps can be 100% integrated to form a seamless solution. Every process can be accessed from a single customizable dashboard. Apptivo also provides the flexibility that is so necessary to today's leading enterprises. Customers can select the exact apps that are necessary to provide optimal business solutions [2].

### **OrangeHRM**

OrangeHRM is a powerhouse human resources tool that any small or midsize business can benefit from using. With OrangeHRM, there have options. It can be downloaded and installed the system on hardware, or it can be purchased a hosted solution. To get prices for the hosted solution, it has to contact them from their Request a Quote page [3].

### **HR.my**

HR.my is a free online Human Resource, Payroll and e-Leave Management platform that offers easy-to-use yet powerful features to improve productivity in all sort of work places. HR.my is a true multi-user online HR Management system. Each Employer account could add unlimited number of employees, who also get to sign up their Employee Web Accounts for free. In the meantime, Employers may also empower employees involved in HR function to manage the Employer account. HR.my is secure. HR.my data privacy is fully protected by restriction of the access for maintenance purpose only, with no third party allowed to access HR.my data at all. HR.my passwords are hashed [4].



## **Sentrifugo**

Sentrifugo Customize and manage Sentrifugo's full-featured, flexible solutions to meet customer organization's needs. A fully-equipped performance appraisal module allows managers to assess employees' performance over a specific period of time and empowers organizations to build their own appraisal process. Put an end to time-consuming administration and paperwork by allowing employees to access and modify information related to them. Define long & short term goals, and set the course for your organization using comprehensive analytics with a broad range of features [5].

## **Zenefits**

Zenefits centralizes everything online, so employee system of record syncs across multiple key systems, including Payroll, Benefits, and Time Off. A dramatic reduction in administrative busywork, and employees who feel more empowered [6].

## Chapter 3: ANALYSIS AND DESIGN

This chapter consists of two main sections. They are Analysis and Design. Analysis section covers functional and non-functional requirement analysis. And also use case diagrams and use case narratives were created.

### 3.1 Analysis

#### 3.1.1 Requirement Analysis

The output from the requirements monitoring process must be analyzed to obtain a complete list of functional and non-functional requirements that can be used to design and implement the system. This analysis forms a fundamental base of the system design stage by building on the requirements captured and creating a comprehensive appreciation of what must be achieved.

#### Functional Requirements

Human Capital Information System mainly focuses on the details management of the employees in the organization.

Human Capital Information System can be categorized in to following categories.

**Process Data:** The system should allow admin user to insert, delete, edit and search their profile detail and also other users (managers and employees who are working in the organization) to view their profiles, add inquires and send requests for important matters.

- **Display-** User with defined roles can display the content of the database. Being more specific, employee can only view his/her personal information. Managers can not only see his/her personal information but also employee's information who are under his/her company. Admin can display their personal information and all employees' information.
- **Add a new user-** Admin is responsible for creating a new user by the specified id assigned in the "Add a new employee" feature. The unique id will be given by the system. Admin will assign a new role such as employee, Manager, and admin to the new created user. If a manager needs to add new user he should send an email to admin with the details of the user.

- **Search-** User with Admin/Manager role can search the content of database for the employees' who are under his/her coverage. Manager and admin roles can search all the employees' information in the database
- **Update authentication-** This feature can be used only by admin role type. Admin can update the role type of a specific user. Admin will be able to update this authentication mechanism.
- **Edit and Delete -** A user with employee role cannot edit or delete his/her specific personal information. Admin can only edit employees' personal information that is under his/her coverage except user role type. Admin can edit or delete all information related to all employees' including their user role type.

### **Report generation**

- **Report generation-** Admin and Managers shall be able to generate various reports in pdf format for each employee based on the information in the database.

### **Send notifications**

- The system should have a facility to send notifications SMS or Emails to the employees for notifying about some important things.

### **Promotion level charts**

- The system has a facility to represent the promotion levels of each and every user by using charts.

### **Non-functional requirements**

Nonfunctional Requirements define system attributes such as security, reliability, performance, maintainability, scalability, and usability. They serve as constraints or restrictions on the design of the system across the different backlogs. A non-functional requirement will describe how a system should behave and what limits there are on its functionality. And also it generally specifies the system's quality attributes or characteristics. The security aspects must be kept simple in such a way once user logs in to system, he must be able to easily manage all system functions.

Though this requirement is not explicitly dealt with in terms of functional requirements, the non-functional requirements should address this requirement. They are no less important than the functional requirements.

Non-functional requirements can be categorized into following categories and newly implementing system should be able to comply with the mentioned requirements.

**Security:** Due to potentially sensitive information being contained within the database, the system should facilitate security and privacy.

**Reliability:** System should be able to perform user required functions without any deviations, which will increase the effectiveness of gate pass management process

**Performance:** There is no restriction on the number of the users to be added to the database. And about resources required response time, transaction rates, throughput, benchmark specifications or anything else having to do with performance.

**Maintainability:** System should be able to function smoothly with less maintenance. If there is any requirement for maintenance, it should be able to perform within a short time period.

**Scalability:** the capability of a system, network, or process to handle a growing amount of work, or its potential to be enlarged to accommodate that growth.

**Usability:** System should have user friendly functions which helps user to learn and adopt to the system easily.

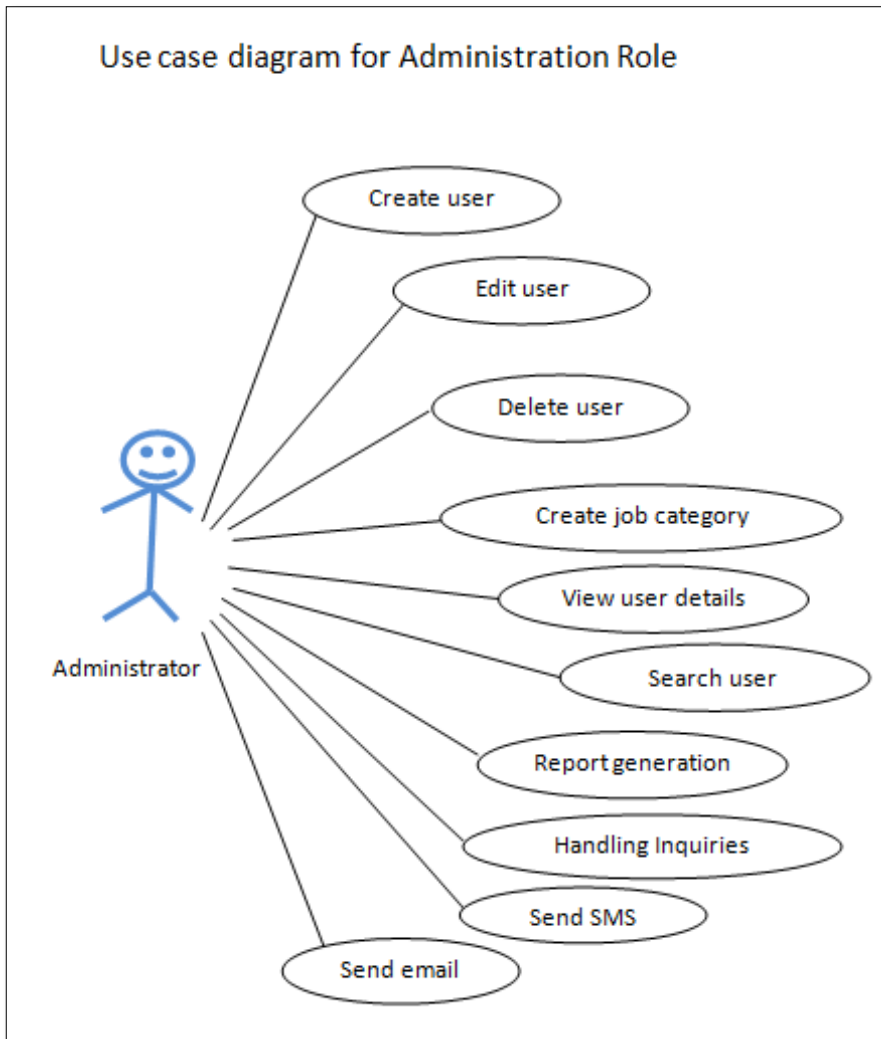
### 3.1.2 High Level Diagrams of Analysis

The relevant high level diagram of newly implementing system for is mentioned below.

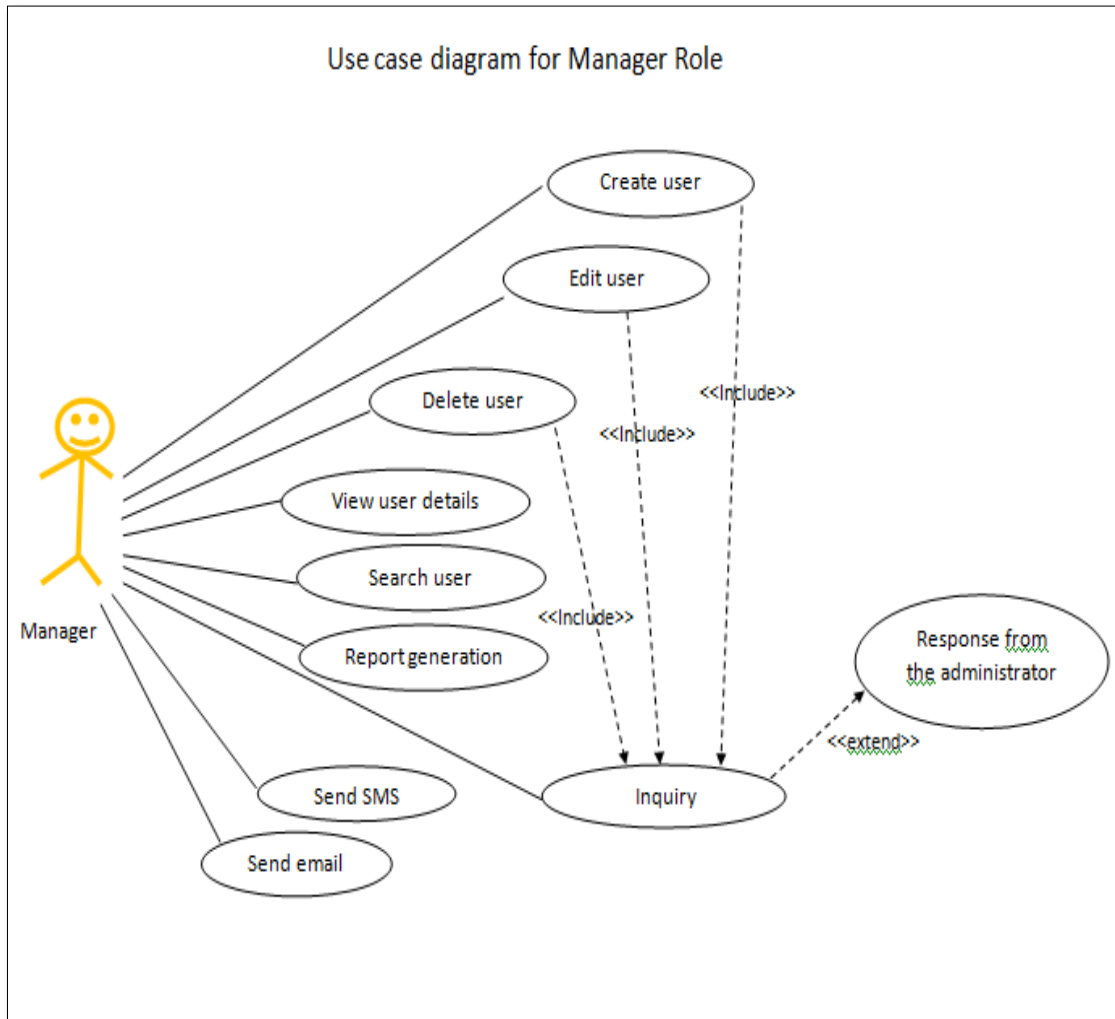
#### Use Case Diagrams

Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors). The use case diagram provides not only a simple way of communicating ideas with users but also, when complete, produces a high level understanding of what must be achieved in the system.

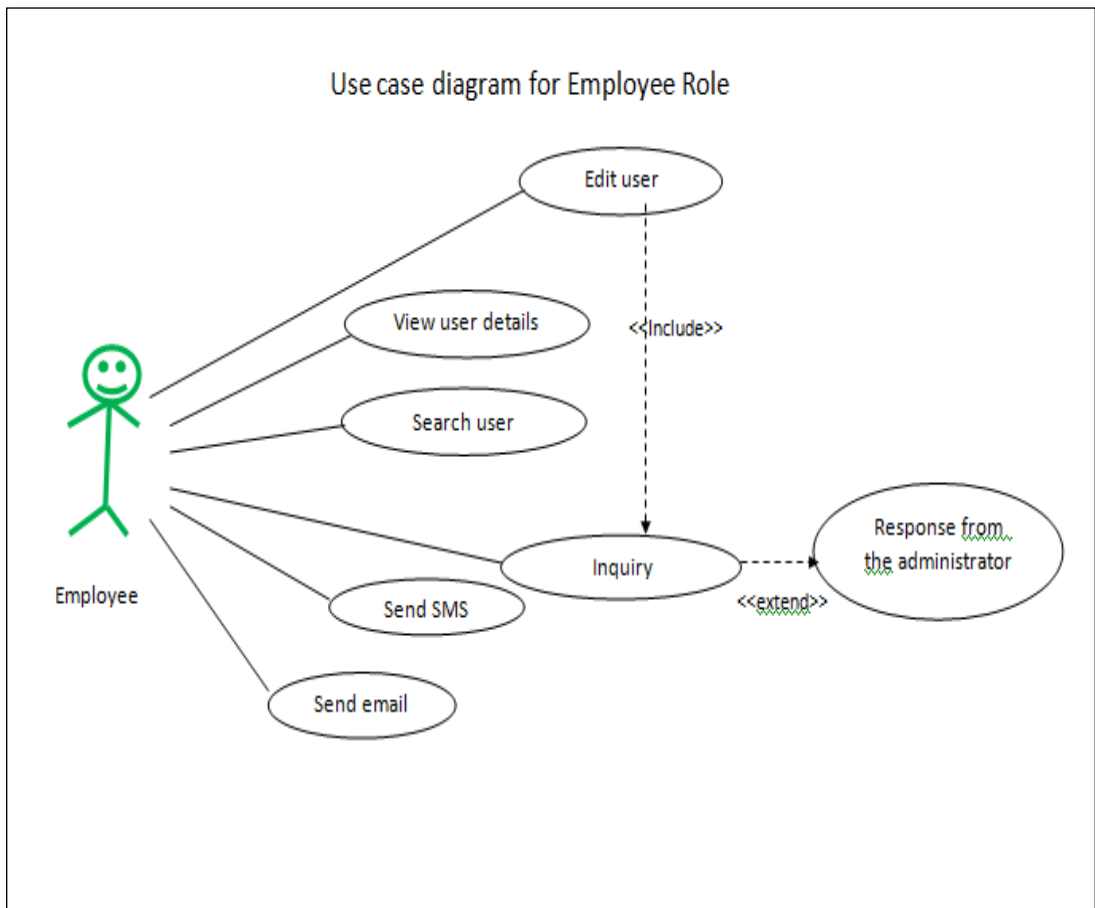
In this section the functionalities and user rolls of the users will be described.



**Figure 1 : Use Case Diagram for Administration Role**



**Figure 2 : Use Case Diagram for Manager Role**



**Figure 3 : Use Case Diagram for Employee Role**

## Use Case Narratives

The below table displays the use case narratives for create and edit user use case. All remaining use case narratives are attached Appendix D

Use Case Name:	Create User/Edit User	Use-Case Type – Business Requirement
Use Case ID:	01	
Priority:	High	
Source:	Document	
Primary Business Actor:	Administrator	
Other Participating Actors:	Manager	
Other Interested Stakeholders:	None	
Description:	Create new user and edit existing users	
Preconditions:	None	
Trigger:	This use case is initiated after logging to the main page in the system	
Typical Course of events	Actor Action	System Response
	Step 1: administrator logs in to the system.	Step 2: system validates user id and password.
	Step 3: administrator selects the subsidiary company.	Step 4: System displays subsidiary companies with details.
	Step 5: enter employee data or update existing data	Step 6: create or update record
Alternate Courses	None	
Post Conditions	Create, Update user details	

**Table 1 : Use Case Narrative for Create User and Edit User**



## **3.2 Design**

### **3.2.1 Methodological Approach**

This phase looks at how the software will be built and how the system will operate with particular emphasis on hardware, software, network infrastructure and user interface. The main purpose of this stage is to create a blueprint that will satisfy all documented requirements, then to identify all inputs, processes and outputs needed and also to help avoid misunderstandings by involving the stakeholders such as managers and users.

There are two types of design to be considered. First, the logical design which includes the design of forms and reports, the design of the interface and the database design. Then the physical design which is concerned with design the physical database, the program, processes and the distributed systems. The design chapter will include a project scope, a system design, component and process design, data design, user displays and output reports.

There are number of software development methodologies each of which are adopted based on a number of factors relating to the project e.g. Time, cost, incorporation of requirement changes during the development process, system complexity, communication between customers and developers, software criticality, size of the development team. These generic models are not definitive descriptions of software processes. Rather, they are abstractions of the process that can be used to explain different approaches to software development.

Methodology is the systematic, theoretical analysis of the methods applied to a field of study. It comprises the theoretical analysis of the body of methods and principles associated with a branch of knowledge. Typically, it encompasses concepts such as paradigm, theoretical model, phases and quantitative or qualitative techniques.

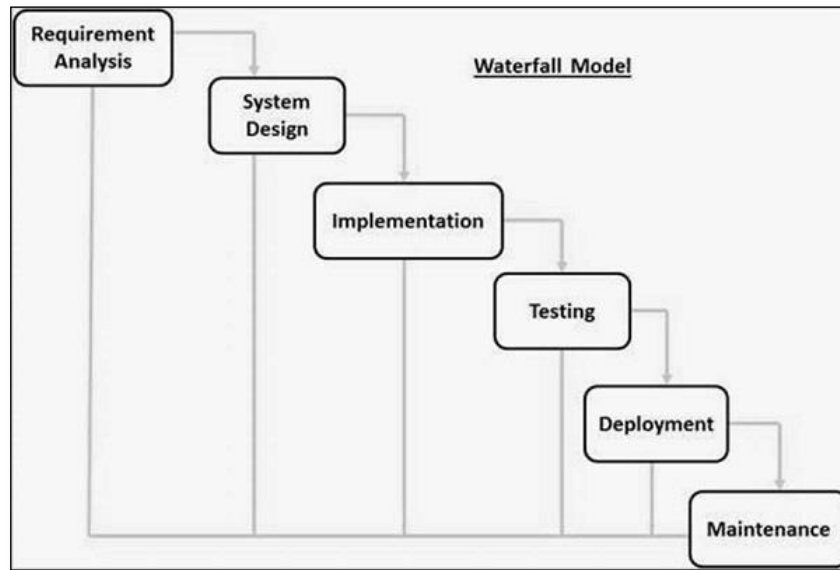
The methodology used for developing of system is “Waterfall Model”.

The waterfall Model illustrates the software development process in a linear sequential flow. This means that any phase in the development process begins only if the previous phase is complete. In this waterfall model, the phases do not overlap.

It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.

Waterfall approach was first SDLC Model to be used widely in Software Engineering to ensure success of the project. In "The Waterfall" approach, the whole process of software development is divided into separate phases. In this Waterfall model, typically, the outcome of one phase acts as the input for the next phase sequentially.

The following illustration is a representation of the different phases of the Waterfall Model.



**Figure 4 : Waterfall Model**

The sequential phases in Waterfall model are used in HCIS as follows;

**Requirement Gathering and analysis** – All possible requirements of the system to be developed are captured in this phase. Currently Senaka Groups of Companies managing their employee details manually. Because of the manual process a lot of problems were occurred. In this phase all the requirements were gathered and analyzed to minimized the problems in the manual system.

**System Design** – Once the requirement gathering and analyzing from first phase are studied in this phase the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

According to the newly implementing system consider three user levels which are active in the system Administration, Manager and Employee has assigned separate functions for improving the accuracy and the security of the system.

**Implementation** – With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality. At this stage users of the system trained on its use, and all aspects of performance tested.

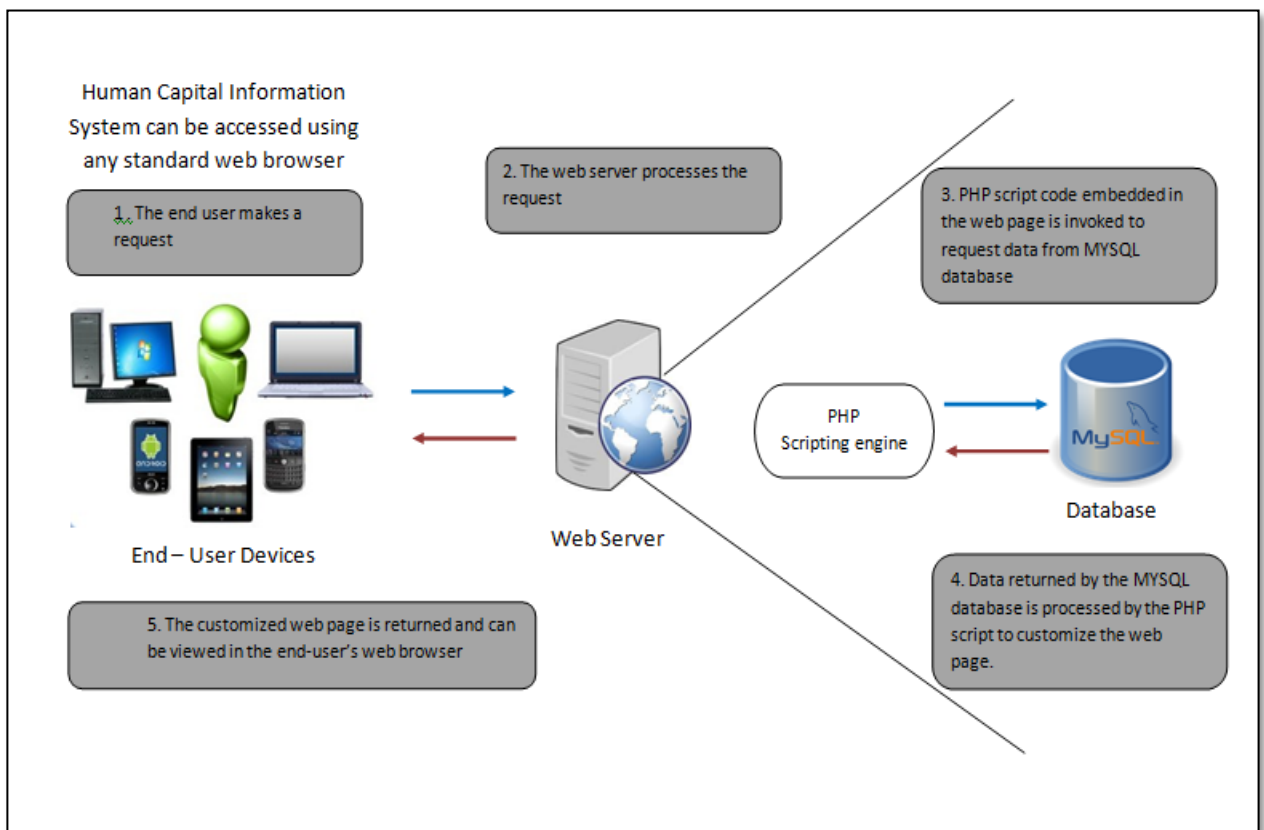
**Integration and Testing** – All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

**Deployment of system** – Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market. In this stage the final newly developed system will be released to the users.

**Maintenance** – There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released and the system should be updated up-to-date. Maintenance is done to deliver these changes in the customer environment.

### 3.2.2 Software Architecture

Software architecture refers to the high level structures of a software system, the discipline of creating such structures, and the documentation of these structures. These structures are needed to reason about the software system.



**Figure 5 : Software Architecture Diagram for Human Capital Information System**

### **3.2.3 Database Design**

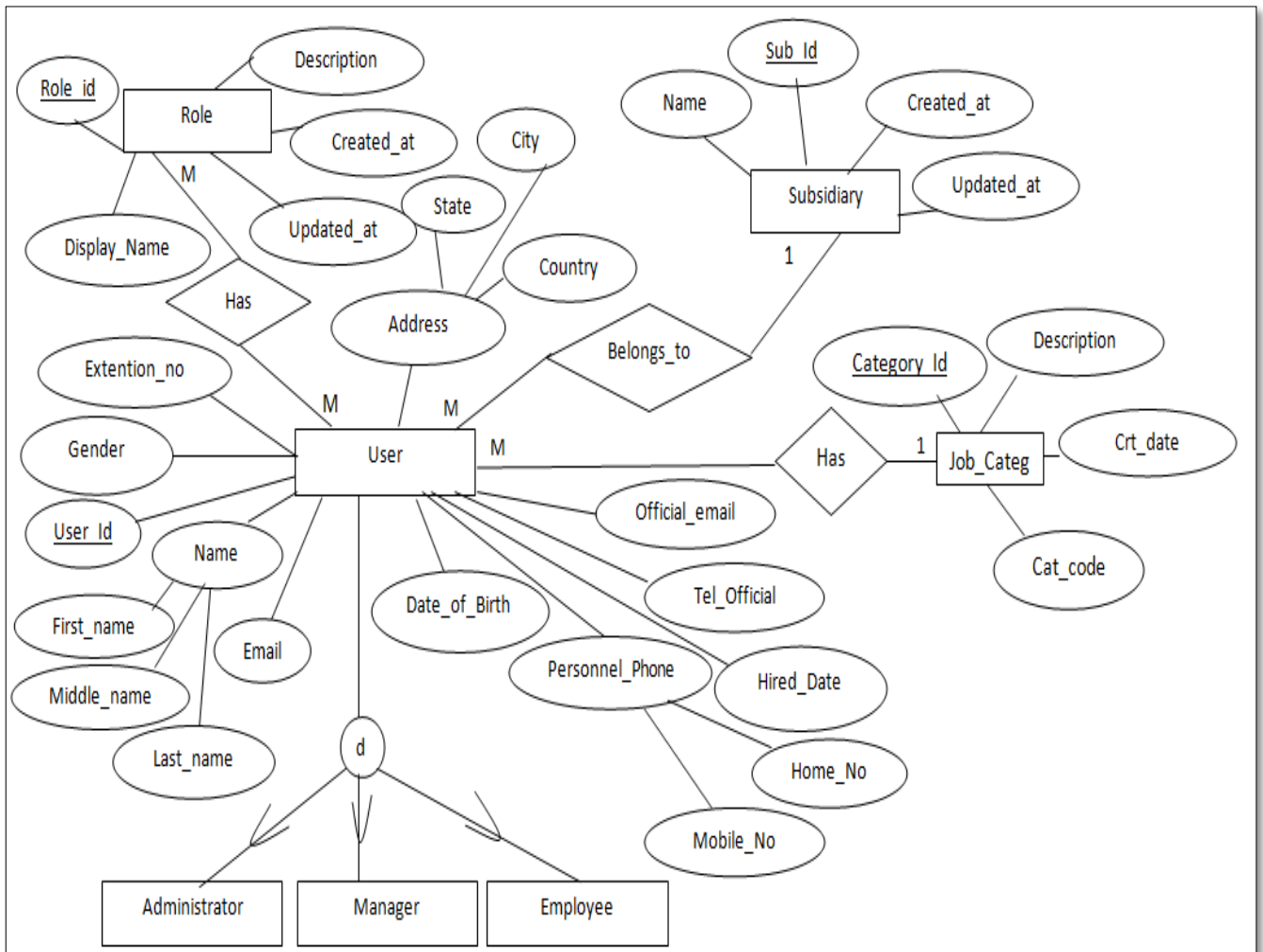
The database design is the foundation of a successful system. To ensure the same, at this stage, all the relevant information is incorporated into the system; the rest of the system design will fall easily around the database. Database design is generally involves the modeling of different Entities, Relationships and Attributes. The design of the database is broken down into three different stages:

- Conceptual database design
- Logical database design
- Physical database design

#### **Conceptual Database Design**

The conceptual design stage is used to build an understanding of each of the entities, relationships and attributes that have been identified.

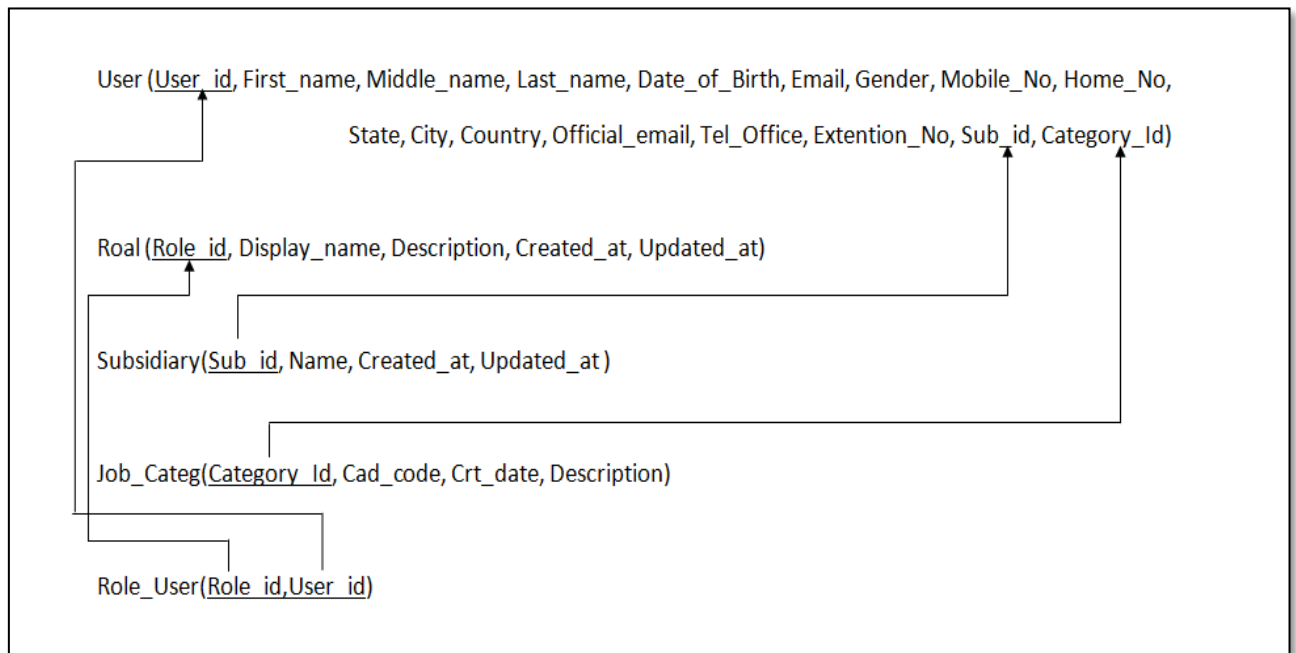
The Entity-Relationship (ER) diagram allows the database designer to get a clear picture of how different entities relate to one-another. Requirement analysis is the most important step of the database life cycle and is typically the most intensive.



**Figure 6 : The Entity-Relationship (ER) Diagram**

## Logical Database Design

Then the conceptual design translated to form a logical design by creating valid relations. The logical database design which incorporates the tasks of deriving relations, validating the relations using normalization, ensuring that all constraints are analyzed and checking and design and implementation of the gate pass management system. From the conceptual model (the E-R diagram) Normalization must be carried out by defining the primary keys and foreign keys.



**Figure 7 : Normalization for Human Capital Information System**

## Physical Database Design

The physical design must then be created and will be dependent on the Database Management System in use. A full script containing the implementation of the database. This specifies the entire database schema including the data type of each attribute.

User			
	User_Id	integer(4)	
	First_name	varchar(200)	
	Middle_name	varchar(200)	
	Last_name	varchar(200)	
	Gender	boolean	
	Sate	varchar(200)	
	City	varchar(200)	
	Country	varchar(200)	
	Email	varchar(200)	
	Date_of_Birth	date	
	Mobile_No	integer(10)	
	Home_No	integer(10)	
	Hired_Date	date	
	Tel_Official	integer(10)	
	Official_email	varchar(200)	
	Extention_no	integer(10)	
	Category_Id	integer(10)	
	Sub_Id	integer(10)	

Role			
	Role_id	integer	
	Display_name	varchar(200)	
	Description	varchar(200)	
	Created_at	date	
	Updated_at	date	

Job_Category			
	Category_Id	integer(10)	
	Cat_code	varchar(10)	
	Crt_date	date	
	Description	varchar(200)	

Subsidiary			
	Sub_Id	integer(10)	
	Name	varchar(200)	
	Created_at	date	
	Updated_at	date	

**Figure 8 : Physical Database Design for Human Capital Information System**

### 3.2.4 High Level UML Design Diagrams

The most suitable high level UML diagrams of newly implementing system is mentioned below.

#### Class Diagram

A class diagram is an illustration of the relationships and source code dependencies among classes in the Unified Modeling Language (UML). In this context, a class defines the methods and variables in an object, which is a specific entity in a program or the unit of code representing that entity.

Class diagram for the new system;

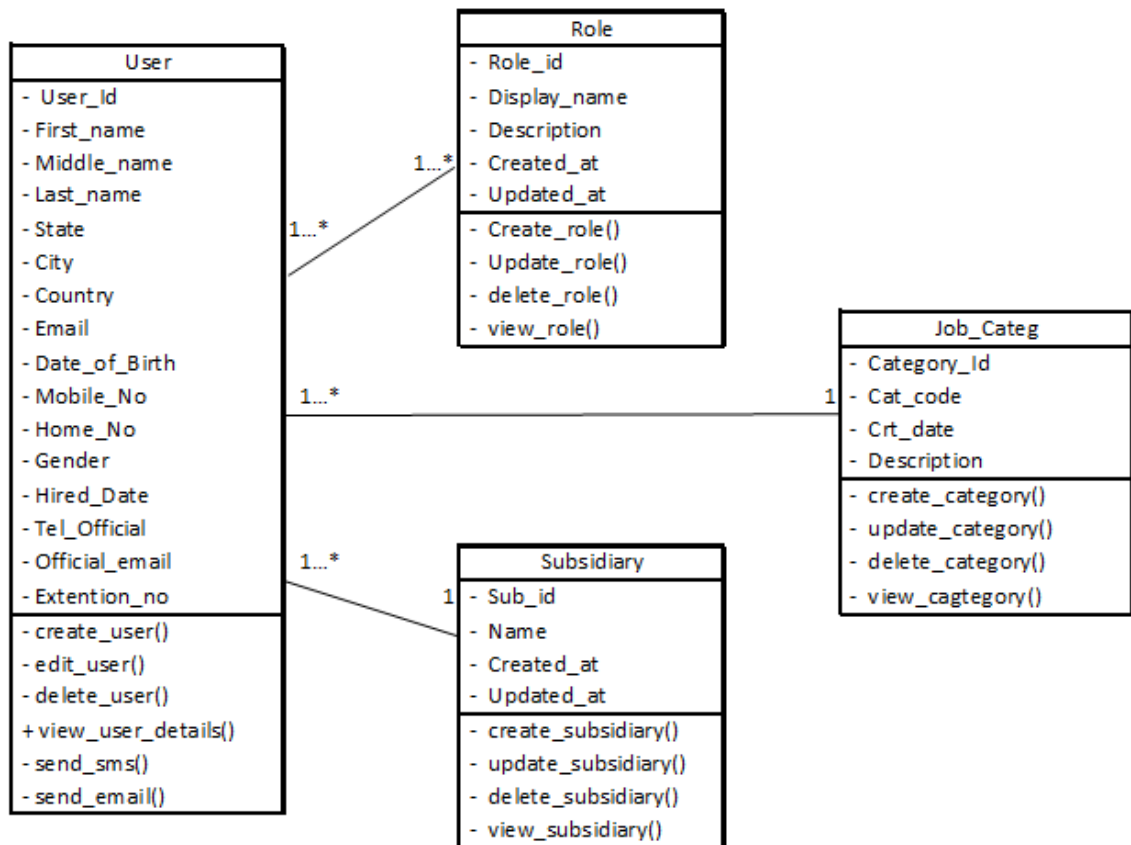
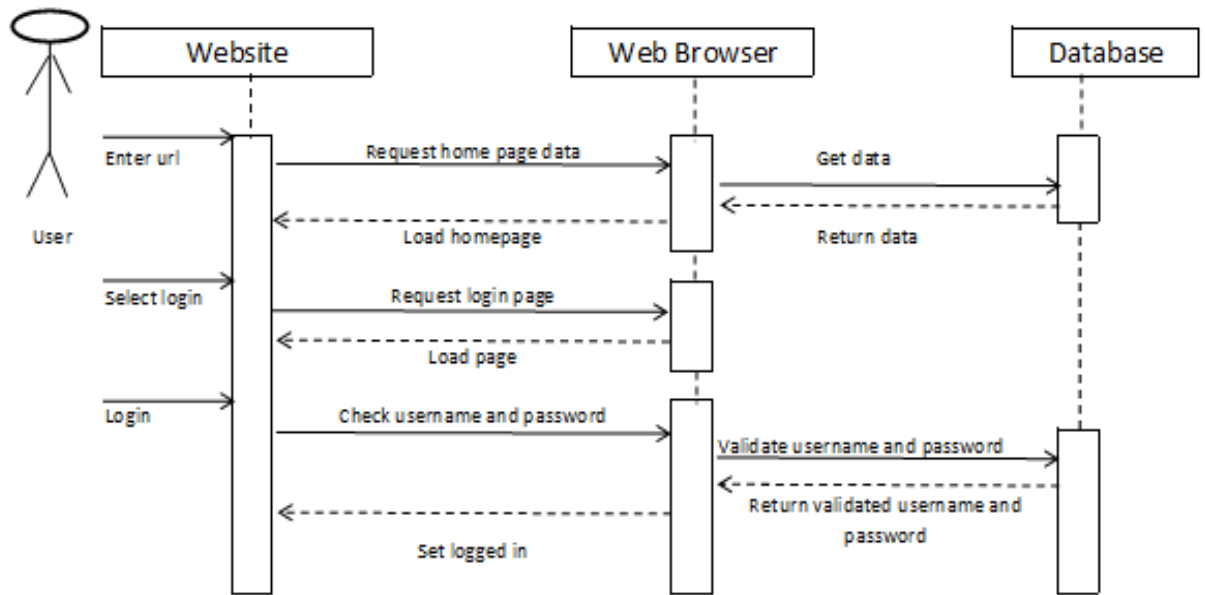


Figure 9 : Class Diagram for Human Capital Information System

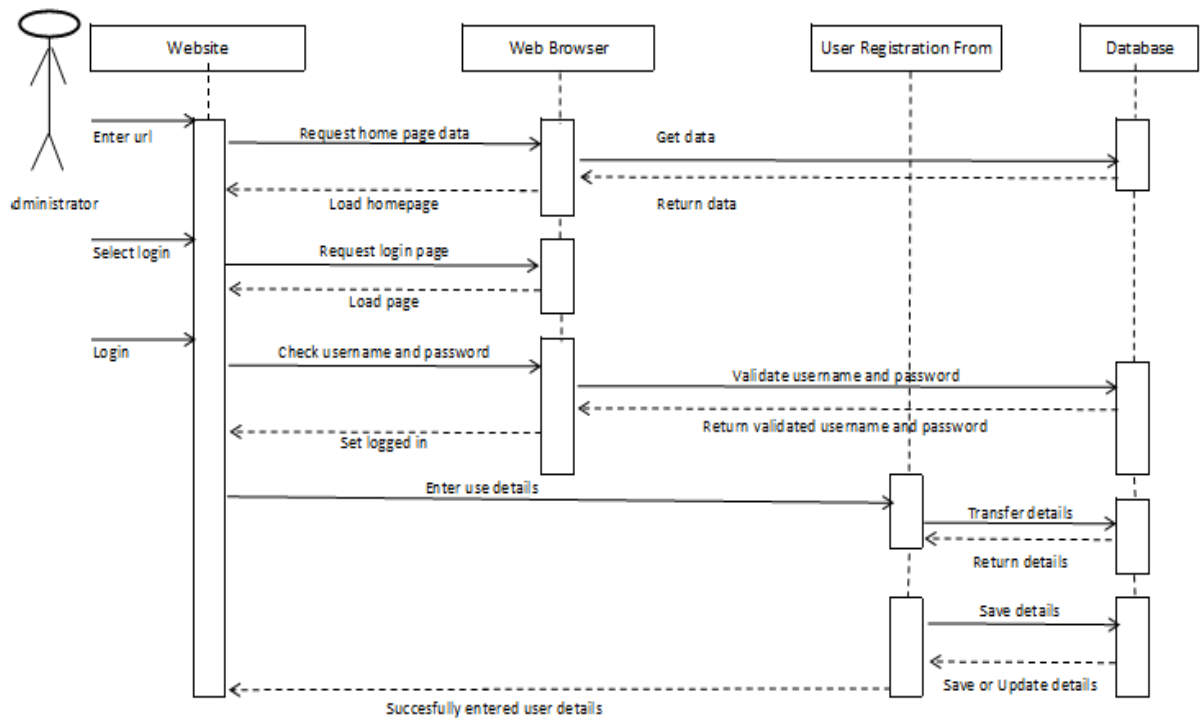


## Sequence Diagrams

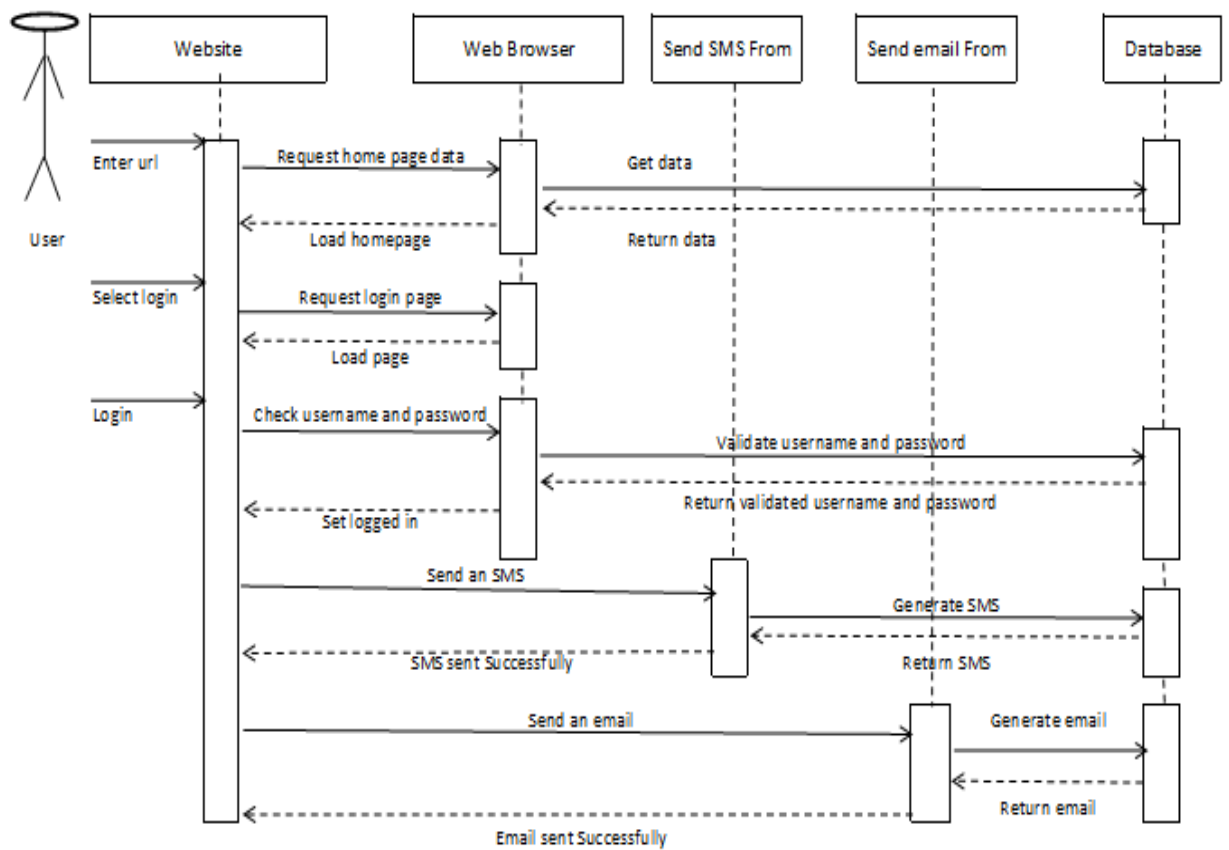
A sequence diagram is an interaction diagram that shows how objects operate with one another and in what order. It is a construct of a message sequence chart. A sequence diagram shows object interactions arranged in time sequence. There are main processes in the system. They are login process, Add new user process, sending sms and email process.



**Figure 10 : Sequence Diagram for Login process**



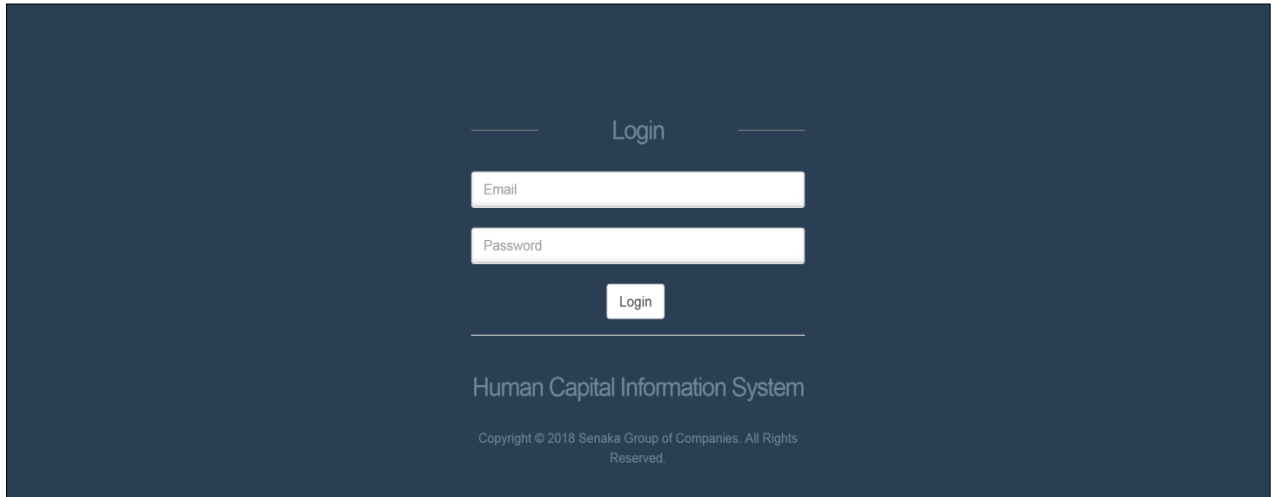
**Figure 11 : Sequence diagram for add new user**



**Figure 12 : Sequence diagram for Sending SMS and Emails**

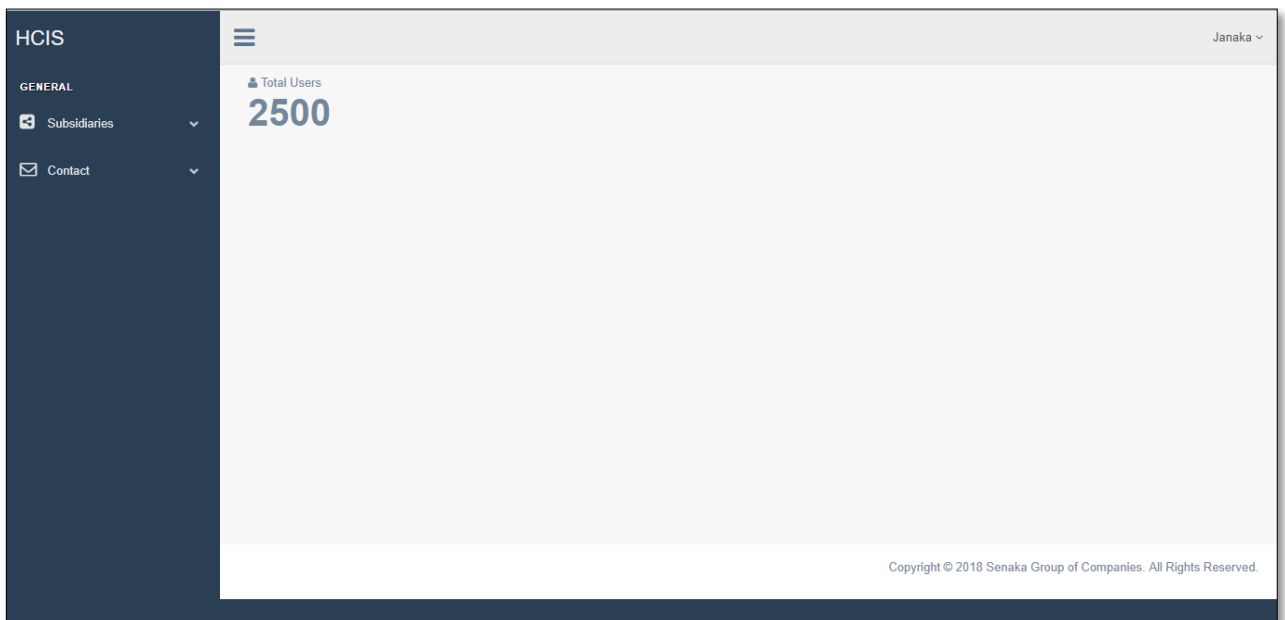
### 3.2.5 User Interface Design

This section describes some important user interfaces and the functionalities of the Human Capital Management System.

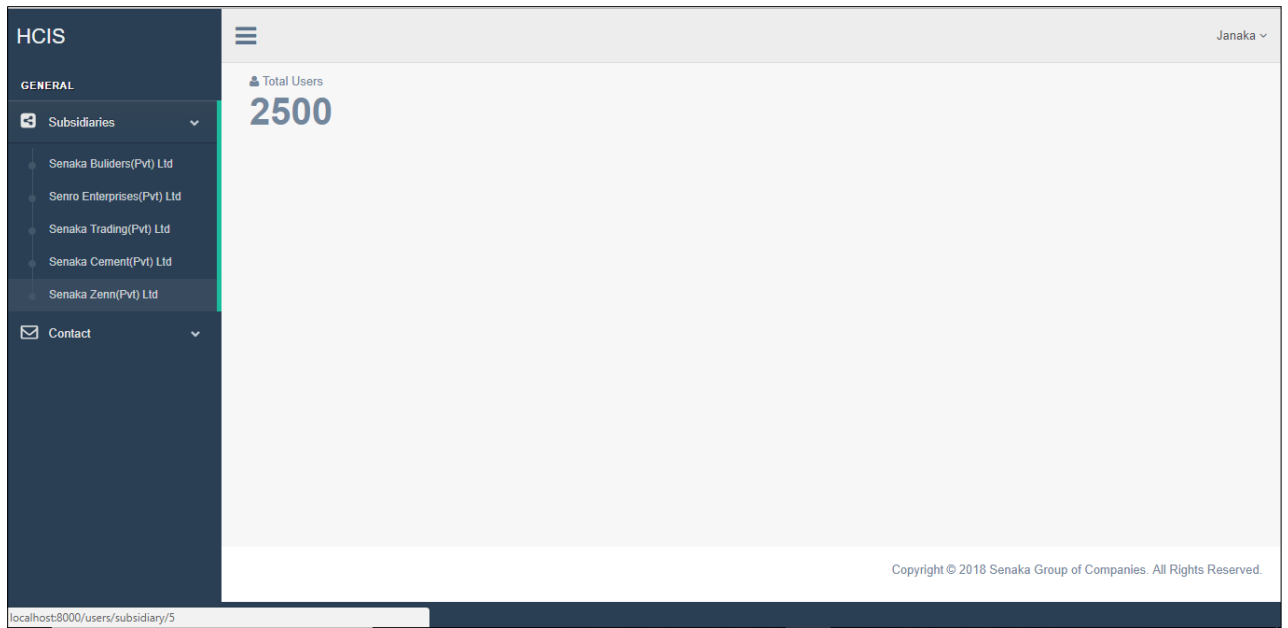


**Figure 13 : User Interface - Login page**

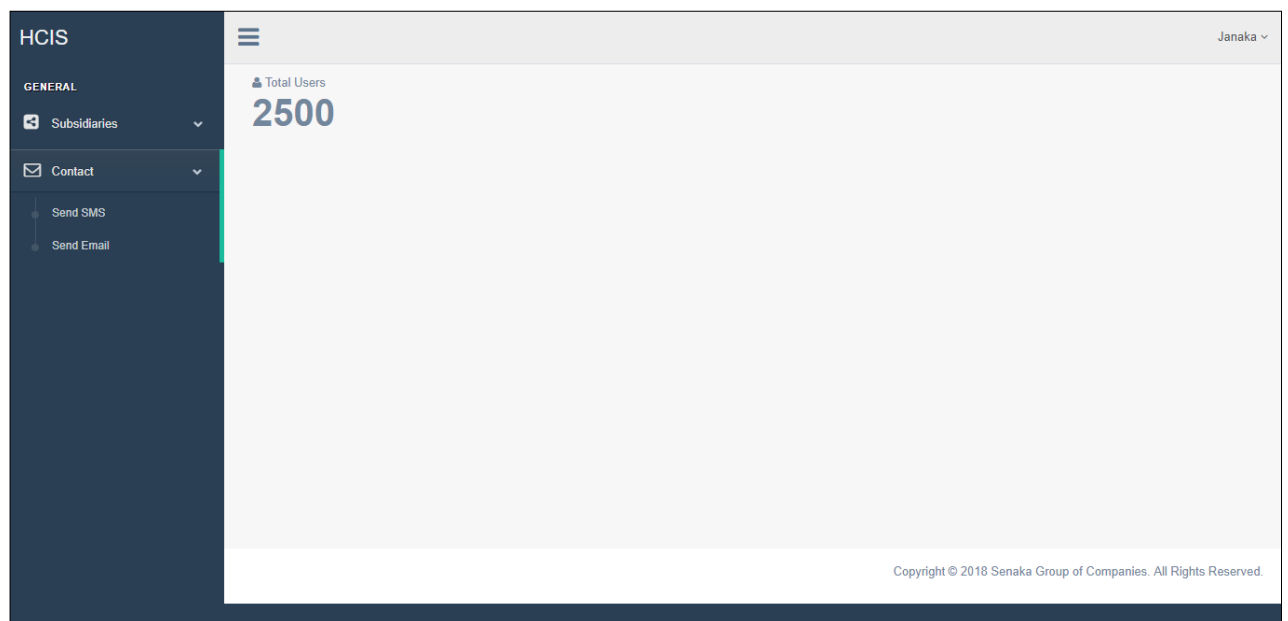
This is the login page of system. Once employee registered with the system, then he/she get a unique user name and password. Using that they can login to their personnel user accounts.



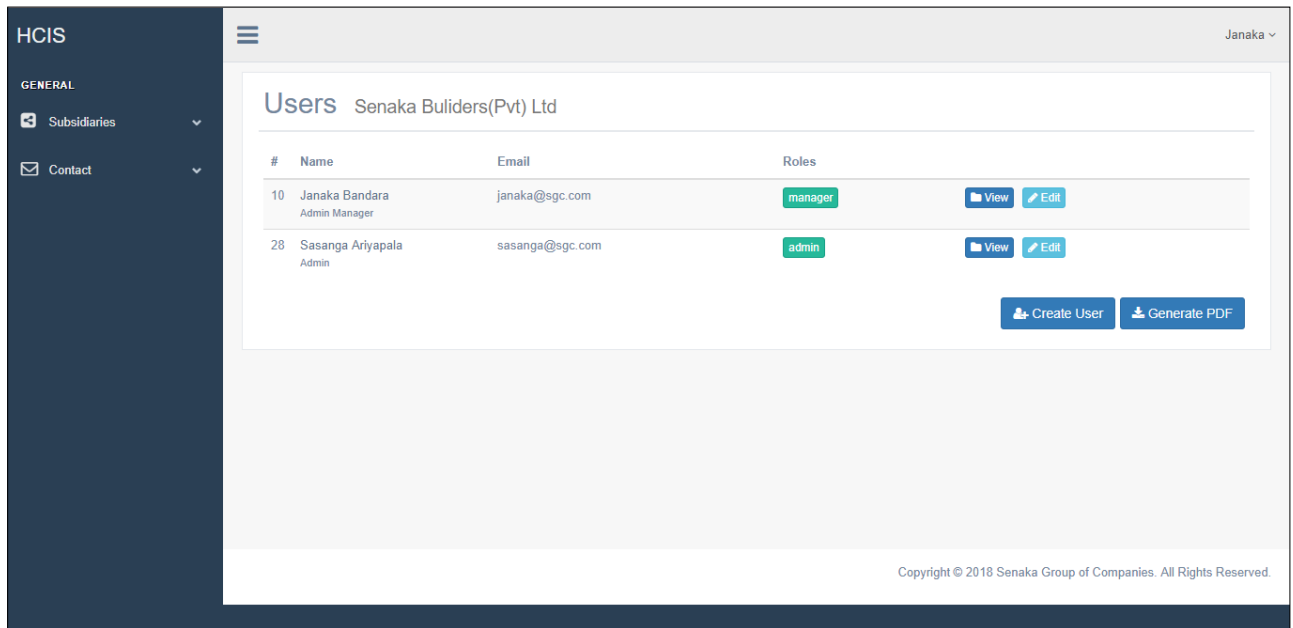
**Figure 14 : User interface - Display the number of users in the system**



**Figure 15 : User Interface - Home page with the extraction of subsidiaries company list**

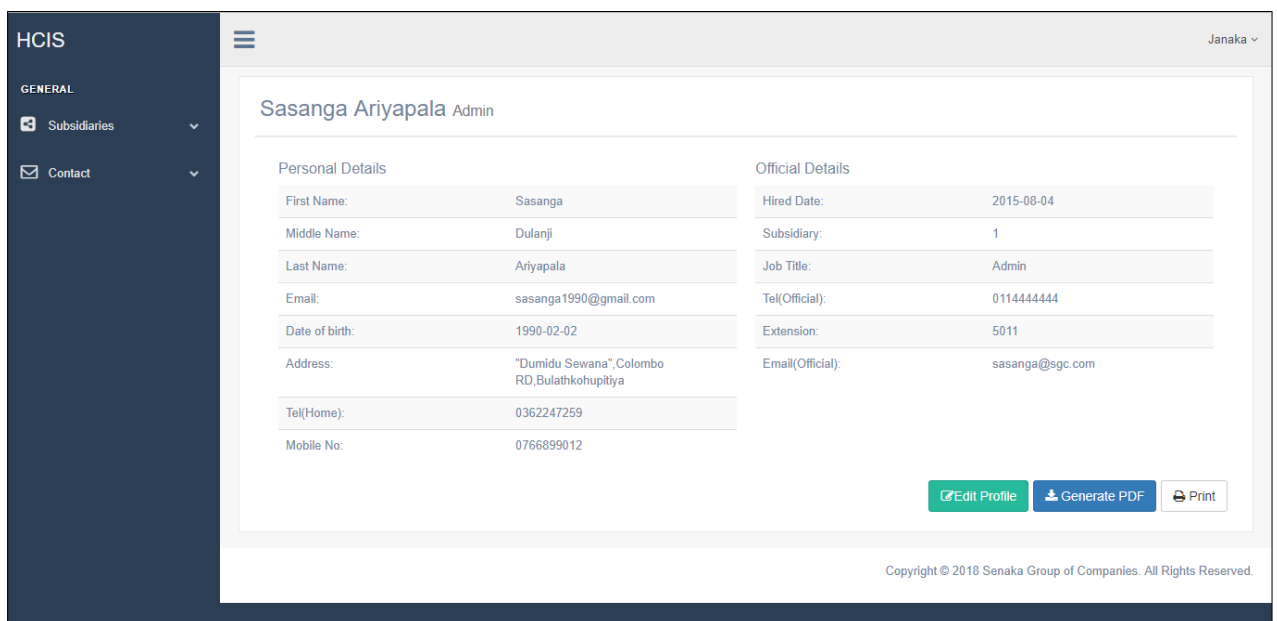


**Figure 16 : User Interface - Home page with the extraction of contact ways**



**Figure 17 : User Interface - List of registered users**

Once we select a subsidiary company, the list of registered users will be displayed. By using Create User button, it will be able to add a new user to HCIS. Only admin will be able to add new user accounts. By using Generate PDF button, the list of registered employee details will be displayed.



**Figure 18 : User Interface - User details**

Once an employee was selected, user details interface will be displayed. There will be three buttons. It will be able to user details by Edit Profile button, by using the Generate PDF button, a detailed pdf will be generated and details will be printed by using Print button.

**GENERAL**

- References
- Subsidiaries
- Contact

### Edit User Sasanga Ariyapala

Press **F11** to exit full screen

Personal Details	Official Details
First Name * Sasanga	Hired Date * 04/08/2014
Middle Name * Dulanji	Subsidiary * 1
Last Name * Ariyapala	Job Title * Administration
Email * sasanga1990@gmail.com	Tel(Official) * 0112234332
Date of birth * 02/02/1990	Extension * 10
Address * Bulathkohupitiya	Email(Official) * sasanga.sgc@gmail.com
City * Colombo	Role <b>Admin</b>
State * Western Province	
Country * Sri Lanka	
Tel(Home) * 0362247259	
Mobile No * 0766899012	

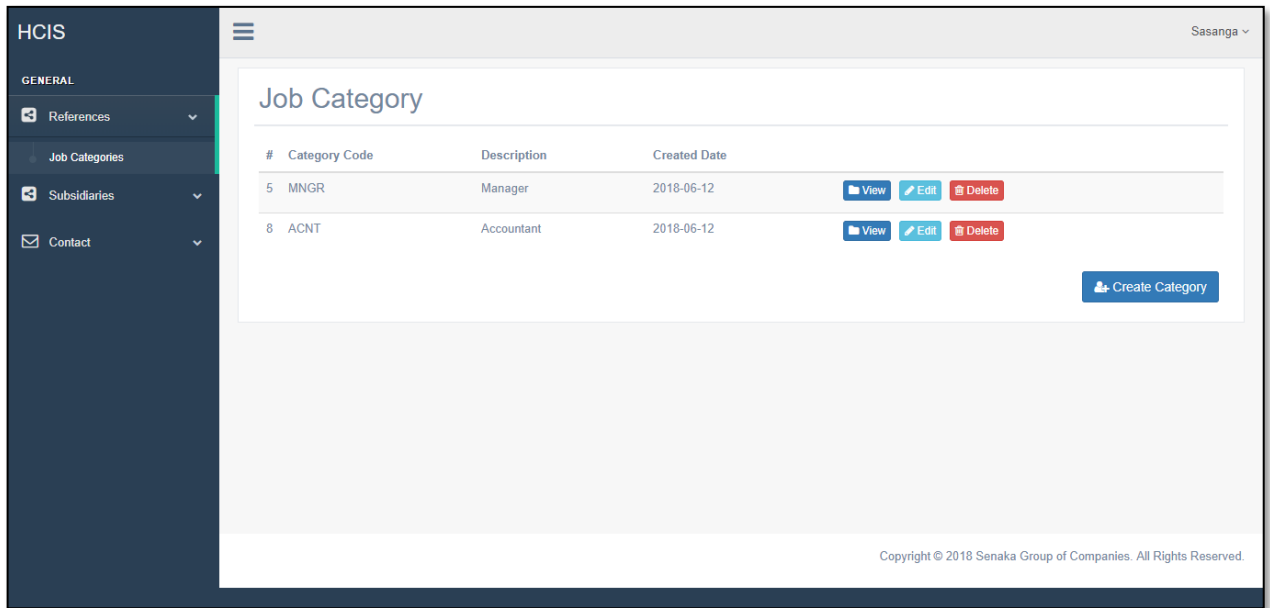
Change Role Cancel Reset Submit

Copyright © 2018 Senaka Group of Companies. All Rights Reserved

**Figure 19 : User Interface - View Employee Details**

In the above figure shows the view of Employee Details Interface. Once an employee was registered by the system admin, then he/she can view their personnel details. And also the owner of the user account will be able to edit their user details with the permission of system admin. If it needs to add or edit the user detail this interface is used and these are the fields should be filled with. And also they will be able to get report of their own details in pdf format and print.

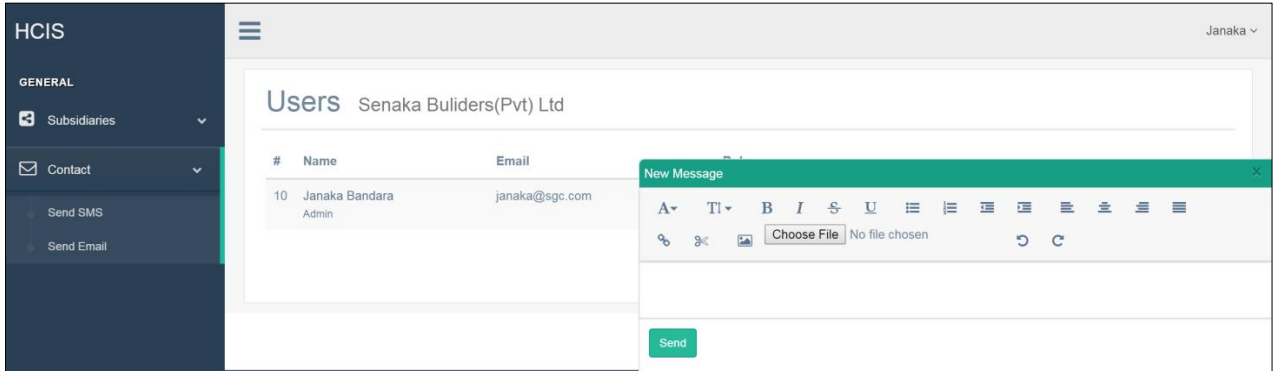
Once details were added, with using the three buttons below, we will be able to submit the details to HCIS, reset the details and also cancel all details.



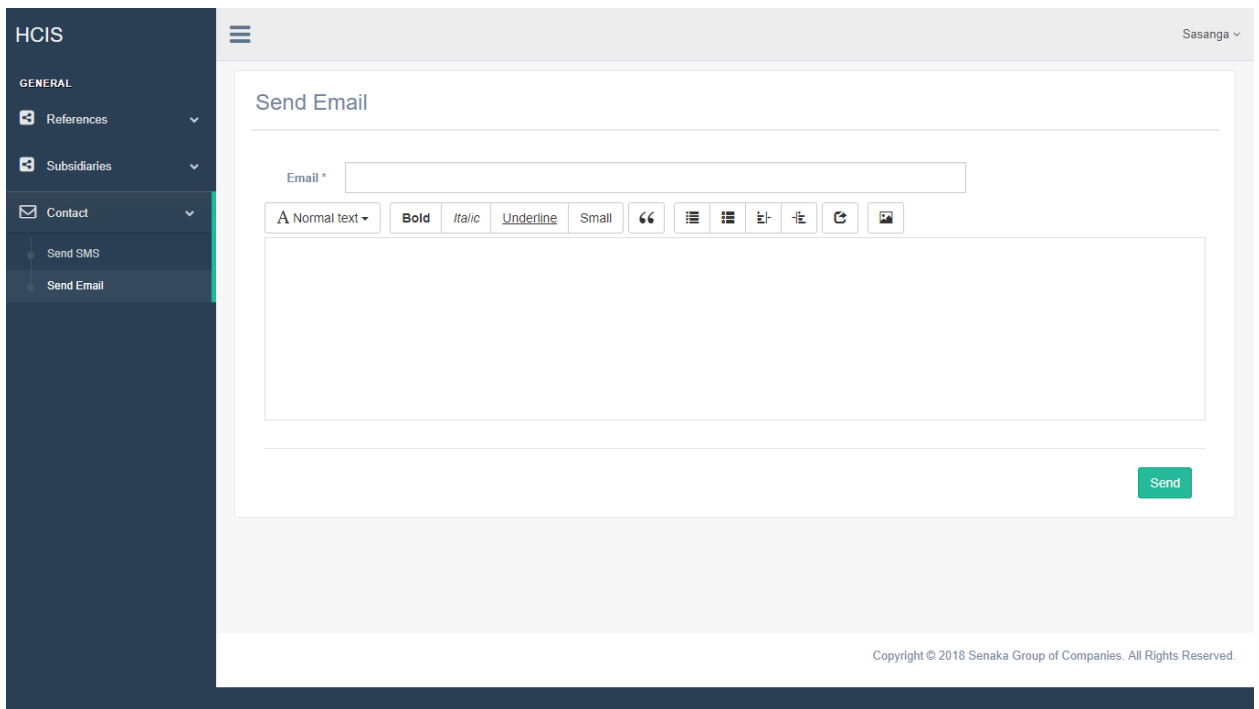
**Figure 20 : User Interface - Job Category**

This figure represents the interface of Job Category. Administrator has the permission to handle this. Every user in the system has a job category. There are various job categories in an organization. Some job categories change or add in various situations. So using this interface system user will be able to add, edit or delete job categories as they needed.

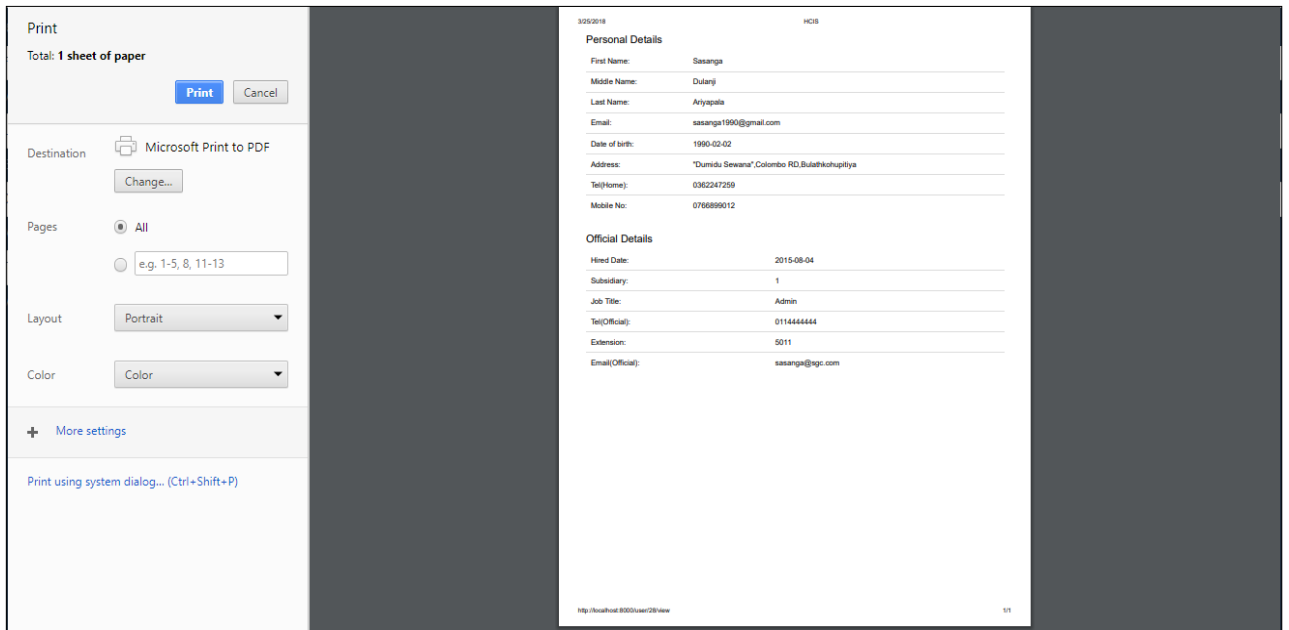




**Figure 21 : User Interface - Sending SMS**

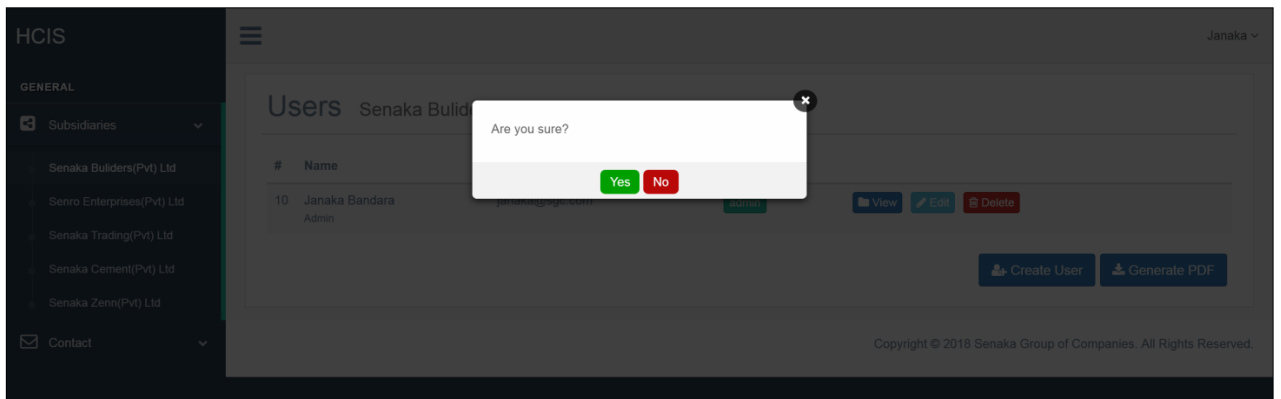


**Figure 22 : User Interface - Sending email**



**Figure 23 : User Interface - Print report**

Print a report and this is the report interface that the user needs to use. The system has a facility of generating various types of reports as user requirements.



**Figure 24 : User Interface - Message box**

Message boxes help to simplify the system to the users with correct directions and important instructions.

## **Chapter 4: IMPLEMENTATION**

### **4.1 Implementation Technology**

For the implementation of the newly built web based system, Laravel Version 5.5 – PHP framework was selected as the framework since the system was built with expressive, elegant syntax. It is accessible, yet powerful, providing powerful tools needed for large, robust applications. And also intended for the development of web application following the model-view-controller (MVC) architectural pattern. Hence, Laravel was setup for SMTP mail and function as drivers for the sending e-mail and basically ambition of PHP, HTML, CSS, Java script and MySQL.

PHP was selected as the scripting language and it is an open source server side scripting language. Platform independent, meaning it can work on all major operating systems. Since PHP supports many types of databases including MySQL and is supported by a large community of users and developers, PHP was an excellent choice for developing web based. This made PHP a language that is easy to learn and understand, and furthermore coding solutions and bugs are resolved quickly. The fact that PHP is platform independent that gave the freedom to develop an application without worrying about the operating system on a user's machine. PHP has the ability to integrate with most web technologies thus it can be used as middleware.

HTML was selected to create web pages with CSS and JavaScript were used to control presentation, formatting, and layout of the web application.

Since MySQL is an open source database that is platform independent and can easily interface with a number of scripting languages and works best with PHP though. And also offers a high-speed data load utility and support for various drivers. As it has some better advantages has proved to be cheap and easy as it doesn't require special hardware or software requirements, it can work well on any web server but most professionals recommend the apache web server. MySQL is an excellent database to use when developing web based applications because its platform independent and can easily interface with a number of scripting languages.

Apache server is an open source software available for free. It is fast, reliable, and secure. It can be highly customized to meet the needs of many different environments by using extensions and modules. As the result of the above advantages apache web server was selected as the most suitable web server for the newly built system.

## 4.2 Software Requirements

Client Side	Server Side
Operating System : Windows 7, Windows 8, Windows 10 or Other compatible OS	Operating System : Windows 7, Windows 8, Windows 10 or Other compatible server OS
Browser : any compatible browser	Web Server : Apache
	Database Server : MySQL
	Framework : Laravel Version 5.5

**Table 2 : Software Requirements**

## 4.3 Hardware Requirements

Client Side	Server Side
Processor : 1.5 GHz	Processor : 2 GHz
RAM : 1 GB	RAM : 2 GB
HDD : 2 GB	System type : 64 bit

**Table 3 : Hardware Requirements**

## **Chapter 5: EVALUATION & TESTING**

### **5.1 Evaluation**

The goal of this effort was to assess the overall usability of Human Capital Information System. Specifically, it was interested in getting knowledge whether users could gain a solid understanding of this new system as well as easily perform common tasks. To meet this goal, a usability study was conducted of the current website design.

Evaluation process was done first three weeks since the finalization of the implementation process. While doing the evaluation, Users continually commented on how exciting and cool this concept was. It was clear many were starting to take what they were learning during the session and thinking of ways they could apply in their own businesses. Many asked when the website was going to be publically available.

#### **5.1.1 Sampling of Subject**

The selected sample size was 50 users were invited and 10 users from each of five subsidiary companies to the Senaka Builders (pvt) Ltd, in No 17, Koswatha Road, Nawala, Rajagiriya, Sri Lanka location, to participate in a usability study of the HCIS web application. During the test session, users were asked to perform several tasks including signing up to become a member, update their profile details and services on the network, send SMS and receive messages etc. Users' errors, comments, and satisfaction ratings were observed and recorded during the study. Each test session lasted 2 hours.

#### **5.1.2 Evaluation Scenarios**

Human Capital Information System mainly focuses on handling employee details in an accurate way. The main expectation of user evaluation which was conducted is to improve features of the system and enhance the interaction of new users.

#### **5.1.3 Tools**

The evaluation tools help for analyzing the system with the effective solutions for the problems occurred. Questionnaires survey and Interviews were the methodologies used as the system evaluation tools.

## **Questionnaires Survey**

The questionnaire survey was prepared with 12 questions and that were given to the selected people to evaluate new system. The questions were based on the criterias which should be evaluated by the system user such as; user authentication levels, system availability, reliability, user friendliness. Appendix B will show the user survey questionnaire format used for the evaluation of Human Capital Information System.

## **Interviews**

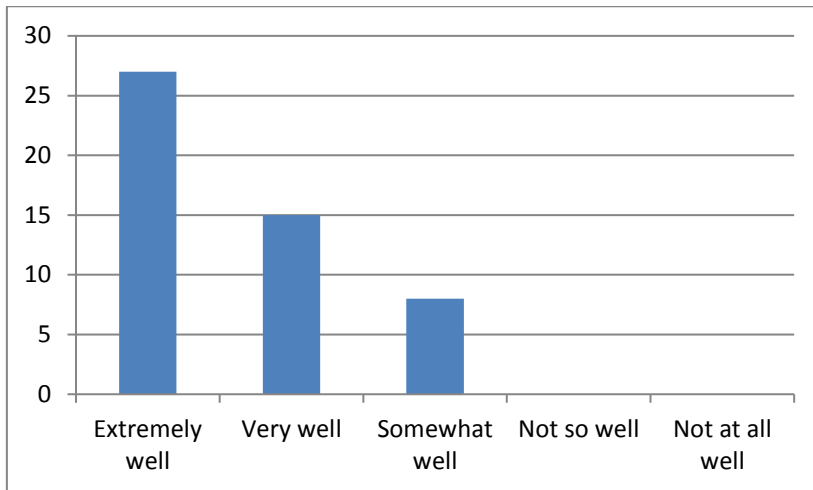
Interviews happened after the completion of the questionnaire. From the information that gained through questionnaires, points to be interviewed were developed. The interviews are very brief which lasted only 15 minutes. Interviews covered questions such as comparison of manual employee details handling and web base employee details handling. By conducting interviews important facts was derived, which directly related to the objectives of the project.

The summary of the interview questions were as follows.

1. How the efficiency of new implemented system when compared with the manual handling?
2. Do you satisfied with the newly implemented Human Capital Information System? Yes/No, If No from which point you are disappointed?
3. How you use privileges of Human Capital Information System, as a user?
4. What kinds of intrusions are prevented from the newly implemented Human Capital Information System when compared to the manual employee details handling process carried out?
5. Are you comfortable to rely on the information of Human Capital Information System?
6. Are you able to fulfill your reporting requirements through Human Capital Information System?
7. Does the system increase your productivity? How it helps to reduce the number of steps of the manual process?
8. Are you able to extract updated information from the system?
9. What is your opinion about the overall performance of the Human Capital Information System?
10. Do you have any other comments about how improve Human Capital Information System further?

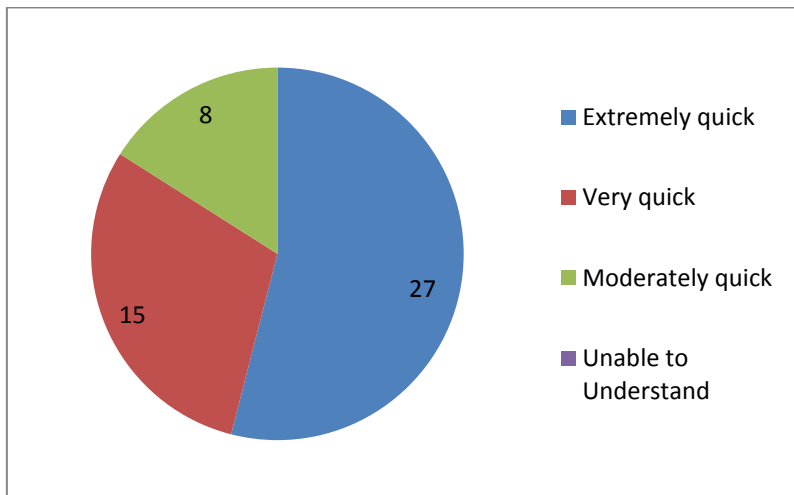
### **5.1.4 Data Analyzing**

The collected raw data were converted to graphical representations which comprised of graphs and charts as to obtain a comparative view and to carry out a simple numerical comparative quantitative analysis. The analysis is represented as Pie Charts and Bar Charts.



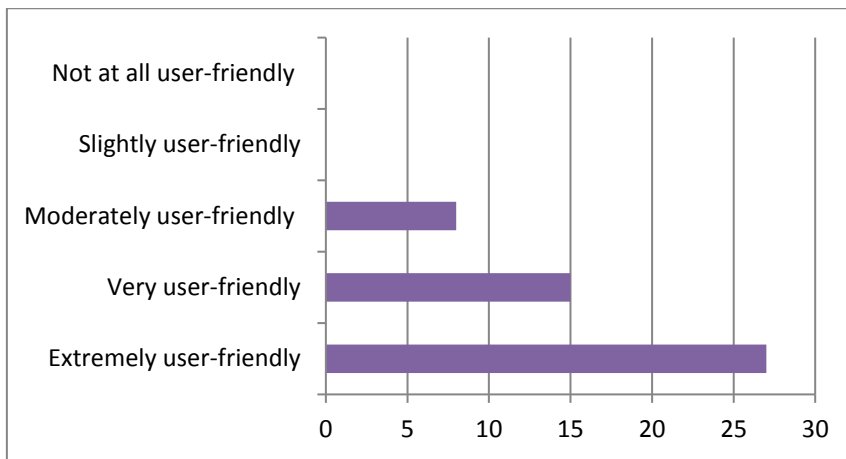
**Figure 25 : Bar Chart - Overall satisfaction**

This above bar chart represents the overall satisfaction for Human Capital Information System. Out of 50 samples 37 employees were extremely satisfied with the application.



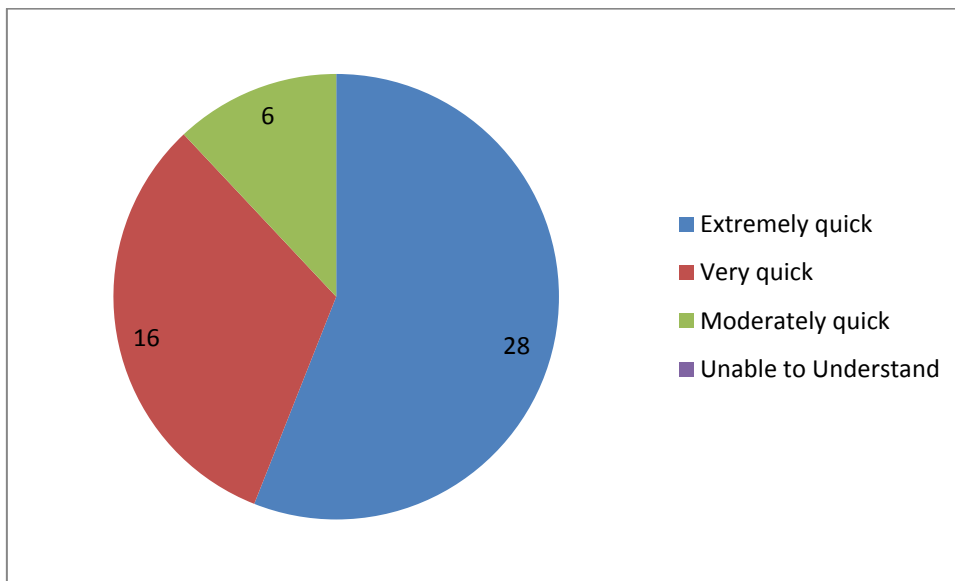
**Figure 26 : Pie Chart - Overall understanding**

Human Capital Information System was extremely quickly understood by 27 employees, very quickly understood by 15 employees out of 50 and rests of others were moderately understood.



**Figure 27 : Horizontal Bar Chart - User friendliness**

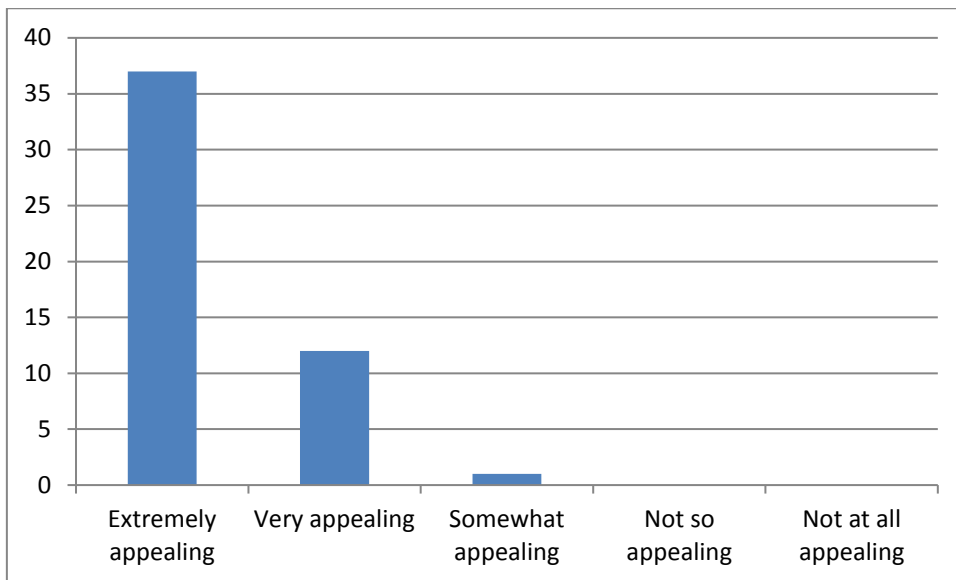
In the above chart displays more than half of the employees satisfied with the interfaces are extremely user friendly and majority of the other employees say that the interfaces are very user friendly. Very few employees say that interfaces are moderately user friendly or slightly user friendly. Nobody say that the interfaces are not at all user friendly. That says the interfaces in the system are user friendly.



**Figure 28 : Pie Chart - Understanding of the process**

This above pie chart represents how the employees understanding of the process in the system and how easy to understand the process belong to the system. 28 employees were extremely quick understood, 16 were very quickly understood, 6 were moderately understood and no one was unable to understand.





**Figure 29 : Bar Chart - Visual appearance**

This bar chart represents the visual appearance of the system. 37 employees were extremely appealing with the system. 12 employees were very appealing and 1 employee was somewhat appealing with the system.

## 5.2 Testing

Testing is a process of executing a program or application with the intent of finding the software bugs. Testing is necessary because we all make mistakes. Some of those mistakes are unimportant, but some of them are expensive or dangerous. It is need to check everything and anything produce because things can always go wrong (*Humans make mistakes all the time*).

There are several reasons which clearly tell us as why Software Testing is important and what are the major things that we should consider while testing of any product or application.

### **Software testing is very important because of the following reasons;**

- Software testing is really required to point out the defects and errors that were made during the development phases.
- It's essential since it makes sure of the user's reliability and their satisfaction in the application.
- It is very important to ensure the Quality of the product. Quality product delivered to the users helps in gaining their confidence.
- Testing is necessary in order to provide the facilities to the customers like the delivery of high quality product or software application which requires lower maintenance cost and hence results into more accurate, consistent and reliable results.
- Testing is required for an effective performance of software application or product.
- It's important to ensure that the application should not result into any failures because it can be very expensive in the future or in the later stages of the development.

The newly implementing system is testing through the manual testing process with the use of developed test cases rather than focusing with the web based automated tools. Manual testing process was more reliable to carry out easily and the test cases were updated with less time period. Since there are large number of users and different types of users in the subsidiary companies, carrying out testing process manually was convenient, as it identified the user experience and their behaviors easily.

### 5.3 Test Plan

A test plan is describing the scope, approach, resources and schedule of intended test activities. It identifies amongst others test items, the features to be tested, the testing tasks, when will do each task, degree of tester independence, the test environment, the test design techniques and entry and exit criteria to be used, and the rationale for their choice and any risks requiring contingency planning. It is a record of the test planning process.

Once the main testing methods are done, validation level was tested based on test cases. Then the other testing techniques such as Performance Testing, User Interface Testing, Final Testing were made accordingly.

#### 5.3.1 Test Cases

Test case is a set of conditions or variables under which a tester will determine whether a system under test satisfies requirements or works correctly. The process of developing test cases can also help find problems in the requirements or design of an application. Here the test cases were prepared based on the Functional and Non Functional requirements.

#### 5.3.2 Test results

The table illustrates the Test results for User login. Other test results are discussed in Appendix C.

1. Login Module:-					
No	Field Name	Input	Expected Output	Actual Output	Pass/Fail
1	Username	User attempts to login with invalid username	The Username should be valid	The system fires error message "Enter valid username"	Pass
2	Password	User attempts to login with wrong password	The Password should be valid	The system fires error message "Enter valid Password"	Pass
3	Username/Password	User attempts to login with wrong password	The Password should be valid	The system fires error message "Invalid Password"	Pass

**Table 4 : Test Result - Login Module**

## **Chapter 6: CONCLUSION AND FUTURE WORK**

### **6.1 Conclusion**

The employees are the valuable asset in all organizations. There should be a accurate method to handle the large number of employee details and all the details should have a better protection unless management has to face problems.

In such situations the management of the company involved in the process of managing the company with its subsidiary companies, such a way that to keep records regarding the employee details like; maintain and keep large amount of employee profiles manually separately, find employees, update employee, add employee etc, all these things had to be carried out manually and because of this large in content handing was also a problem, on the other hand keeping large amount of files and paper documents maintenance may cost a lot and it was not efficient for a company with large amount of employee like this. And also manual record keeping was also not a reliable method as people tend to forget things.

As a solution for the manual details handling the newly implemented system introduced easy methods to handle employee details through a web application.

The aim of this project was to develop an online system that can handle and manage the activities involved in the company in an efficient and reliable way. Less managing personnel and easy searching availability, sending useful notifications and user profile managing were major goals in this project.

Administrator plays the major role in the system and priority of handling employee details become the main responsibility. As the organization has five subsidiary companies, the employee details of each company will handle separately by the manager of each company. Main functions as adding new users, edit user details, delete user details are done by the administrator. Managers have permission only to make a request to the administrator once they need to add new user details, edit user details. Administrator and managers will be able to generate reports as they needed. The function sending SMS and Email will available for all users. But only the employee will be able to SMS or Email to his/her superior levels. In the employee level it has pre-defined phone number and Email addresses.

Before started to implement the new system, first had a discussion with the organization manager and then analyzed the requirements for the new system. According to the requirements system design was done. Once the design was done, get approval from some of the organization users and then finalized the design. Then implementation part was started.

As the selected methodology was waterfall model, in order to finalize the methodology that going to be used for the implementation, performed a comparison between similar systems and newly implementing system. Main functions such as technology used,

hardware, etc. were considered during the comparison and according to the outcome, designing methodology was decided. Two phases are included in designing section. First, the logical design which includes the design of forms and reports, the design of the interface and the design of database. Then the physical design which is concerned about the physical database, program, processes and the distributed systems. The methodology used for the development and implementation of system is “Waterfall Model”. The generic approach for software designing is Top-Down design.

Since the new system is a web based system for the implementation it used Laravel Version 5.5 – PHP framework was the selected as the framework. And also intended for the development of web application following the model-view-controller (MVC) architectural pattern. Hence, Laravel was setup for SMTP mail and function as drivers for the sending e-mail and basically ambition of PHP, HTML, CSS, Java script and MySQL. PHP was selected as the scripting language and it is an open source server side scripting language. HTML was selected to create web pages with CSS and JavaScript were used to control presentation, formatting, and layout of the web application. Since MySQL is an open source database that is platform independent and can easily interface with a number of scripting languages and works best with PHP though. Apache server is an open source software available for free. It is fast, reliable, and secure. It can be highly customized to meet the needs of many different environments by using extensions and modules.

The selected 50 of sample from the organization formed a test using two methods. Interviews and questionnaires were the methodologies that was selected for testing. And then asked to perform several tasks including basic functions. Comments and satisfaction ratings were observed and recorded during the study. Each test session lasted 2 hours.

Manual testing mechanisms were included following the test plan and the test cases. Test cases were prepared based on the Functional and Non Functional requirements. The system was tested with different types of values such as single value, multiple values and it can generate expected output.

At the data analyzing stage after the user evaluation, most of users were satisfied with the system. As the result of that, the system was very user friendly and also much easier to understand quickly.

Human Capital Information System solved the problems they faced. The application was designed such way that it generates the necessary reports of the employees at any time. So there were not many worries. It allows administrative department also to collect accurate and comprehensive employee information.

## 6.2 Future Developments

- Complain box can be created to register and store complains.
- Interactions among various employees of the organization through live chats.
- Discussing any details with employees across various parts of the company.
- Build a connection with Employee Attendance Management System.
- Build a connection with Employee Payroll Management System.
- Build a connection with Employee Recruitment Management System.

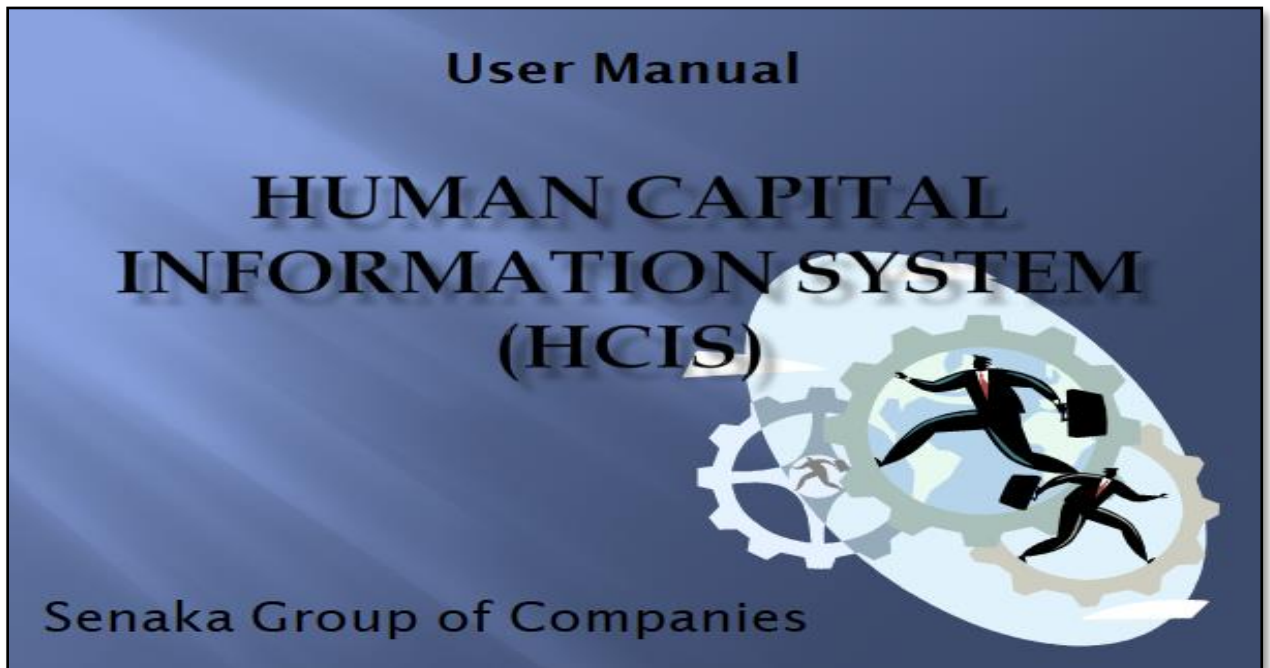
Apparently, the role of Human Capital Information System is basic and essential within each company that wants to keep a really good control and record concerning its personnel data, functionality and performance on all levels in its structure. Every organization, in nowadays, has the necessity of managing its staff on a really good level as the staff has definitely the greatest merit of building up a company as such as it is. The well managed staff means giving the appropriate financial awareness and all kind of benefits as such as they have been deserved. That's why the development of such systems is not just a programming business, a lot of people are ordinarily involved in such projects and one of the basic requirements is the reliability of the system, especially what concerns the storage of data and all of the operations that will be performed upon it.

## References

- [1] “Spun Concrete In Sri Lanka | Senaka Zenn (Pvt) Ltd” Internet: [www.spunconcrete.lk/](http://www.spunconcrete.lk/)
- [2] “Apptivo” Internet: [www.apptivo.com/](http://www.apptivo.com/)
- [3] “OrangeHRM | Open Source HR Management” Internet: [www.orangehrm.com](http://www.orangehrm.com)
- [4] “HR.my” Internet: [www.hr.my/doc/get-started.html](http://www.hr.my/doc/get-started.html)
- [ 5] “Sentrifugo” Internet: [www.sentrifugo.com/features](http://www.sentrifugo.com/features)
- [6 ] “Zenefits” Internet: [www.zenefits.com/hr/management/](http://www.zenefits.com/hr/management/)

## Appendices

### Appendix A: User Manual



#### General Information

#### System Overview

Human Capital Information System (HCIS) is software that handles company employee details without any manual effort.

The Major advantage of HCIS,

- It's online, so that information is available anytime.
- High integrity and security.
- Ability to incorporate newly available data.
- It is user friendly
- Speed and accuracy is increased
- Fully automated.
- Security is associated with user authentication
- Duplication of information is curbed.



## System Configuration

### Software Requirements

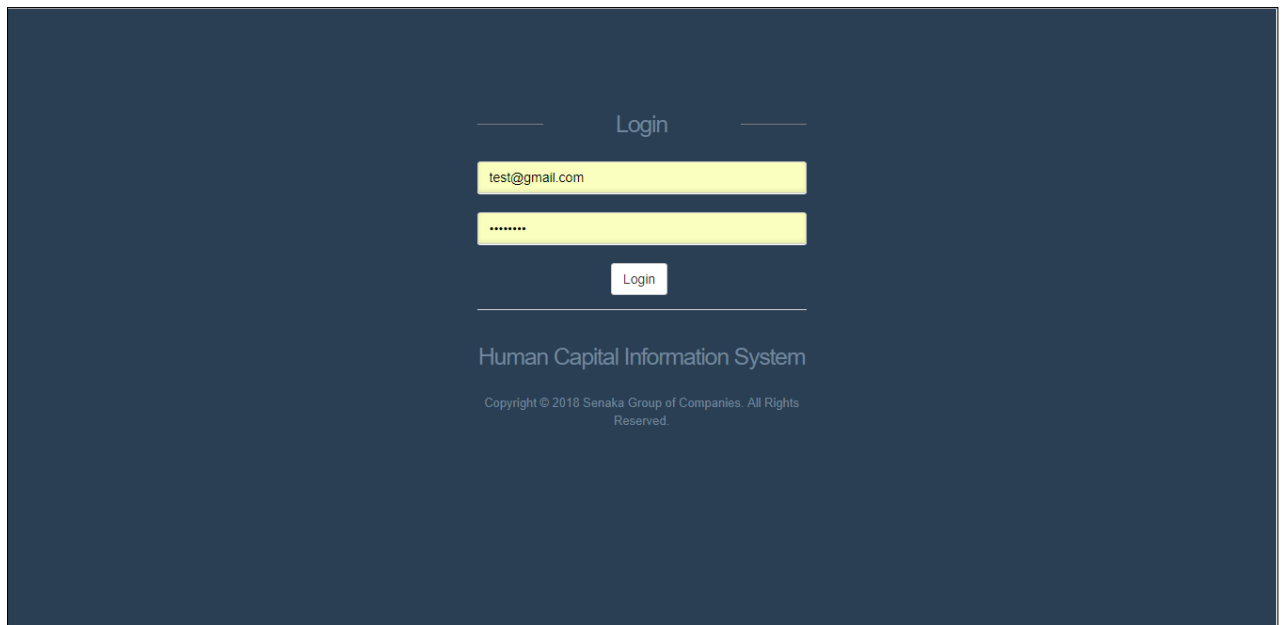
Client Side	Server Side
Operating System : Windows 7, Windows 8, Windows 10 or Other compatible OS	Operating System : Windows 7, Windows 8, Windows 10 or Other compatible server OS
Browser : any compatible browser	Web Server : Apache
	Database Server : MySQL
	Framework : Laravel Version 5.5

### Hardware Requirements

Client Side	Server Side
Processor : 1.5 GHz	Processor : 2 GHz
RAM : 1 GB	RAM : 2 GB
HDD : 2 GB	System type : 64 bit

## Application Layouts

### Login page



————— Login —————

test@gmail.com

.....

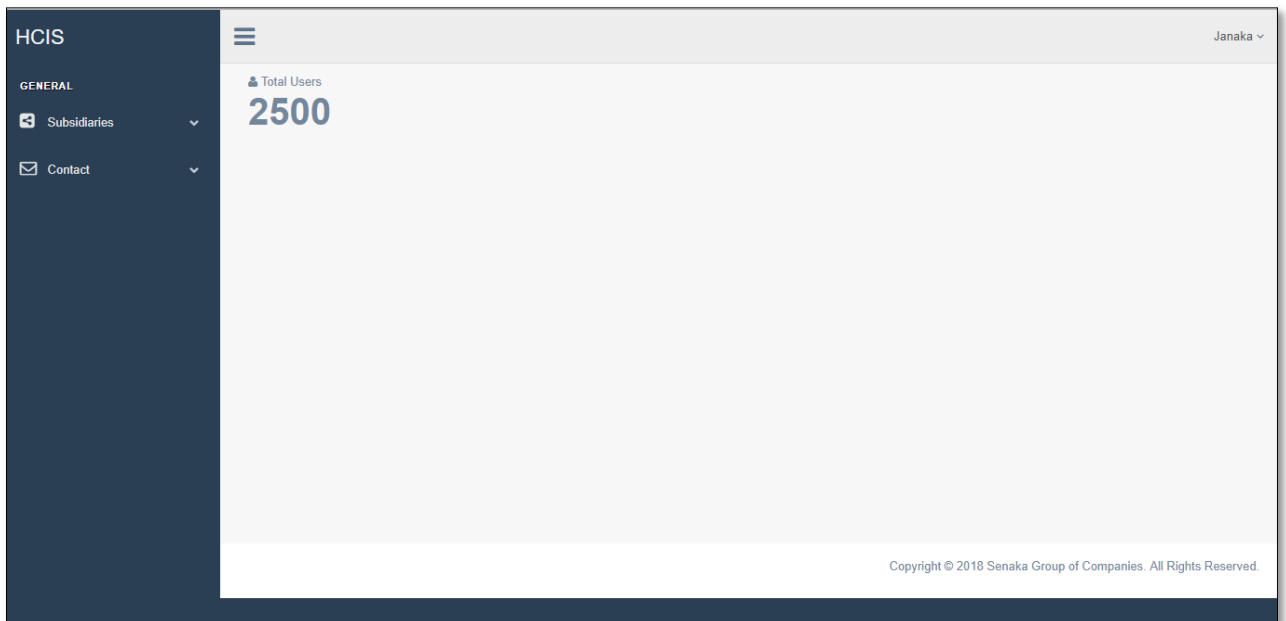
Login

Human Capital Information System

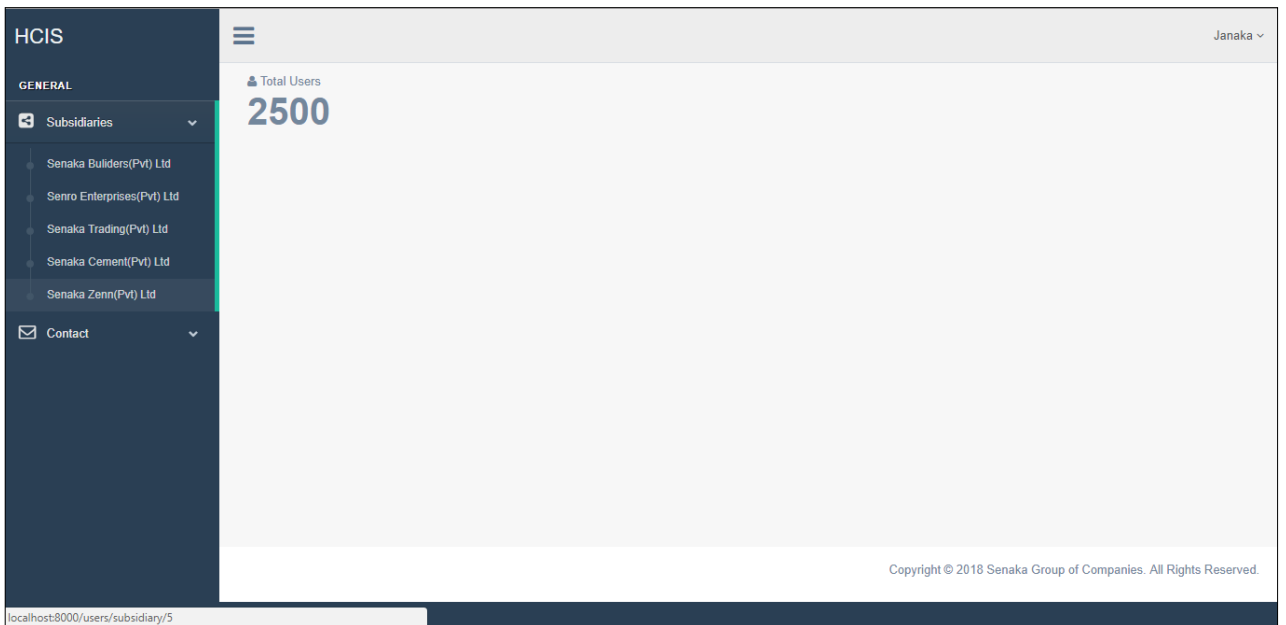
Copyright © 2018 Senaka Group of Companies. All Rights Reserved.

## Home page

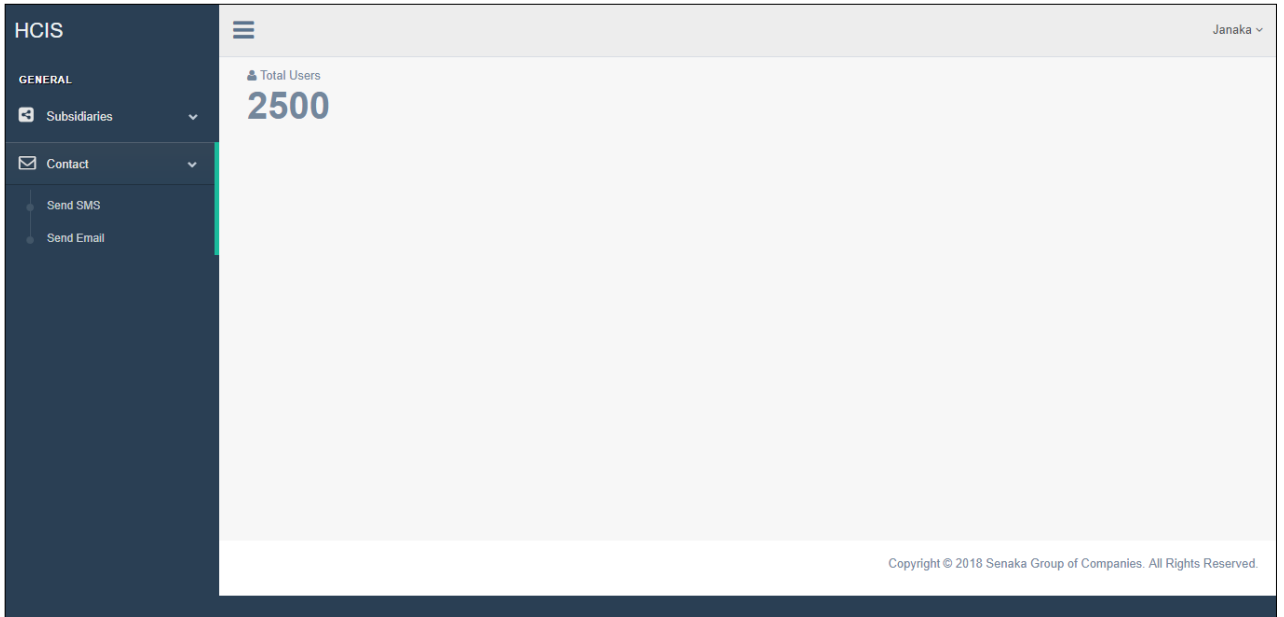
Displays number of users that can be added to HCIS.



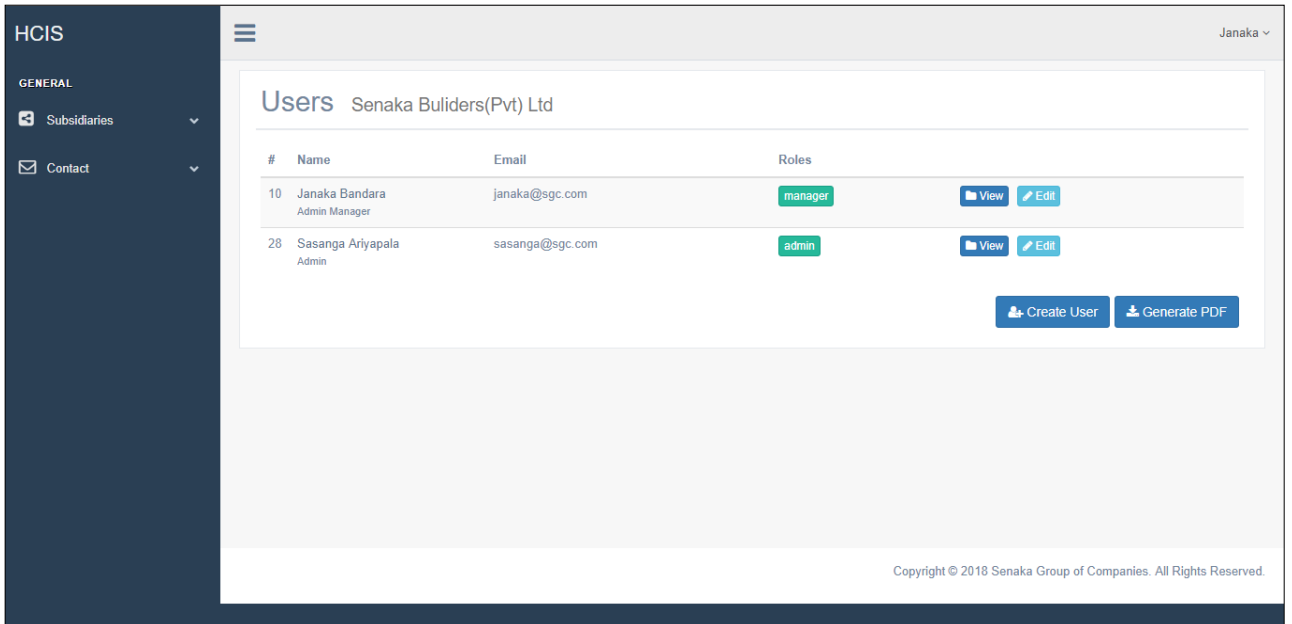
## Home page with the extraction of subsidiaries company list.



## Home page with the extraction of contact ways



## The registered user summary list



Once we select a subsidiary company, the list of registered users will be displayed. By using Create User button it will be able to add a new user to HCIS. Only admin will be able to add new user accounts. By using Generate PDF button, the list of registered employee details will be displayed.

## User details will be displayed

The screenshot shows the HCIS user details page for 'Sasanga Ariyapala Admin'. The page is divided into two main sections: 'Personal Details' and 'Official Details'. The 'Personal Details' section includes fields for First Name (Sasanga), Middle Name (Dulanji), Last Name (Ariyapala), Email (sasanga1990@gmail.com), Date of birth (1990-02-02), Address ('Dumidu Sewana', Colombo RD, Bulathkohupitiya), Tel(Home) (0362247259), and Mobile No (0766899012). The 'Official Details' section includes Hired Date (2015-08-04), Subsidiary (1), Job Title (Admin), Tel(Official) (0114444444), Extension (5011), and Email(Official) (sasanga@sgc.com). At the bottom right, there are three buttons: 'Edit Profile' (green), 'Generate PDF' (blue), and 'Print' (grey). The footer contains the text 'Copyright © 2018 Senaka Group of Companies. All Rights Reserved.'

Once an employee was selected, user details interface will be displayed. There will be three buttons. It will be able to user details by Edit Profile button, by using the Generate PDF button, a detailed pdf will be generated and details will be printed by using Print button.

## Print page settings – Print Button

The screenshot shows the print settings dialog box overlaid on the user details page. The print settings include:
 

- Print: Total: 1 sheet of paper. Buttons: Print, Cancel.
- Destination: Microsoft Print to PDF. Button: Change...
- Pages: All (selected). Input field: e.g. 1-5, 8, 11-13.
- Layout: Portrait (selected).
- Color: Color (selected).
- More settings: + More settings.
- Print using system dialog... (Ctrl+Shift+P)

 The background shows the user details page for 'Sasanga Ariyapala Admin' with the same personal and official details as shown in the previous screenshot. The page number '51' is visible at the bottom right of the background page.

## Add and Edit User Interface

GENERAL

- References
- Subsidiaries
- Contact

### Edit User Sasanga Ariyapala

Press F11 to exit full-screen

**Personal Details**

First Name \*

Middle Name \*

Last Name \*

Email \*

Date of birth \*

Address \*

City \*

State \*

Country \*

Tel(Home) \*

Mobile No \*

**Official Details**

Hired Date \*

Subsidiary \*

Job Title \*

Tel(Official) \*

Extension \*

Email(Official) \*

Role Admin

Change Role
Cancel
Reset
Submit

Copyright © 2018 Senaka Group of Companies. All Rights Reserved.

## Create Job Category

HCIS

GENERAL

- References
- Job Categories
- Subsidiaries
- Contact

### Job Category

#	Category Code	Description	Created Date	
5	MNGR	Manager	2018-06-12	<span style="background-color: #27ae60; color: white; padding: 2px 5px;">View</span> <span style="background-color: #27ae60; color: white; padding: 2px 5px;">Edit</span> <span style="background-color: #e74c3c; color: white; padding: 2px 5px;">Delete</span>
8	ACNT	Accountant	2018-06-12	<span style="background-color: #27ae60; color: white; padding: 2px 5px;">View</span> <span style="background-color: #27ae60; color: white; padding: 2px 5px;">Edit</span> <span style="background-color: #e74c3c; color: white; padding: 2px 5px;">Delete</span>

+ Create Category

Copyright © 2018 Senaka Group of Companies. All Rights Reserved.

## List of users – Generate Reports in PDF format using PDF button

Senaka Buliders(Pvt) Ltd

Name	Email	Role	Job Title	Hired Date	Tel.	Ext.	Date of Birth	Address	Mobile No
Sasanga Dulanji Ariyapala	sasanga1990@gmail.com	admin	Admin	2015-08-04	0114444444	5011	1990-02-02	"Dumidu Sewana", Colombo RD, Bulathkothupitiya	0766899012
Janaka Sandaruwan Bandara	janbdr@gmail.com	manager	Admin Manager	2017-01-01	0112222222	5010	1988-10-01	No 1, Thalagama North	0716377244

There are various types of reports generated by the system. Those are user details in summary, each and every company employee details etc.

## Contact way – Sending a SMS

HCIS

Senaka Buliders(Pvt) Ltd

Users

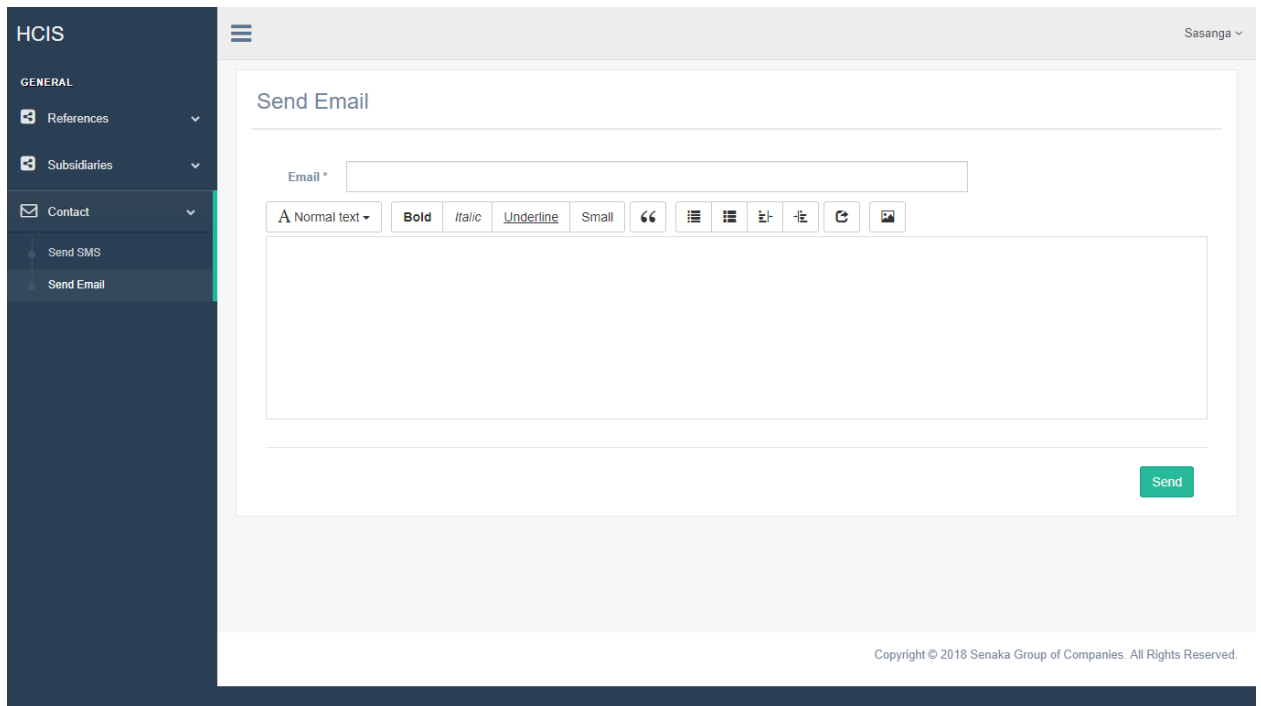
#	Name	Email	Roles	View	Edit
10	Janaka Bandara Admin Manager	janaka@sgc.com	manager	<a href="#">View</a>	<a href="#">Edit</a>
28	Sasanga Ariyapala Admin	sasanga@sgc.com	admin	<a href="#">View</a>	<a href="#">Edit</a>

[Send SMS](#)

[New Message](#)

[Send](#)

## Contact way - Sending an Email



HCIS

Sasanga

GENERAL

- References
- Subsidiaries
- Contact
  - Send SMS
  - Send Email

### Send Email

Email \*

A Normal text **Bold** *Italic* Underline Small “ ” ☰ ☲ ☳ ☴ ☵ ☶ ☷

Send

Copyright © 2018 Senaka Group of Companies. All Rights Reserved.

## Appendix B: User Evaluation

### User Survey for Human Capital Information System Evaluation

**Designation:** .....

Company: (Senaka Builders, Senaka Trading, Senaka Cement Products, Senaka Zenn, Senro Enterprises )

1. Overall, how well does the HCIS meets your needs?

Extremely well	
Very well	
Somewhat well	
Not so well	
Not at all well	

2. How easy was it to find what you were looking for on HCIS?

Extremely easy	
Very easy	
Somewhat easy	
Not so easy	
Not at all easy	

3. Did it take you more or less time than you expected to find what you were looking for on HCIS?

A lot less time	
A little less time	
About what I expected	
A little more time	
A lot more time	

4. How user satisfy with the visually appealing of HCIS?

Extremely appealing	
Very appealing	
Somewhat appealing	
Not so appealing	
Not at all appealing	

5. How easy is it to understand the information on HCIS?

Extremely easy	
Very easy	
Somewhat easy	
Not so easy	
Not at all easy	



6. How much do you trust the information on HCIS?

A great deal	
A lot	
A moderate amount	
A little	
Not at all	

7. How satisfied are you with the HCIS website look and feel?

Extremely satisfied	
Very satisfied	
Moderately satisfied	
Slightly satisfied	
Not at all satisfied	

8. How would you rate the availability of HCIS?

Excellent	
Very Good	
Good	
Bad	
Very Bad	

9. How long did you take to understand the process of the system?

Extremely quick	
Very quick	
Moderately quick	
Unable to Understand	

10. How user-friendly is the interfaces in the system?

Extremely user-friendly	
Very user-friendly	
Moderately user-friendly	
Slightly user-friendly	
Not at all user-friendly	

11. How successful is the system in performing its intended task?

Extremely successful	
Very successful	
Moderately successful	
Slightly successful	
Not at all successful	

12. Do you have any other comments about how improve HCIS further?

## Appendix C: Test Cases

### Admin Module

<b>2. Admin Module</b>					
<b>No</b>	<b>Field Name</b>	<b>Input</b>	<b>Expected output</b>	<b>Actual Output</b>	<b>Pass/ Fail</b>
1	Name	Enter the name	Record valid	Record inserted	Pass
2	NIC	Enter the NIC	Record valid	Record inserted	Pass
3	Address	Enter the Address	Record valid	Record inserted	Pass

**Table 5 : Test Result - Admin Module**

## Employee Module

No	Field Name	Input	Expected output	Actual Output	Pass/ Fail
1	First Name	Enter the First name	Record valid	Record inserted	Pass
2	Middle Name	Enter the Middle name	Record valid	Record inserted	Pass
3	Last Name	Enter the Last name	Record valid	Record inserted	Pass
4	NIC	Enter the NIC	Record valid	Record inserted	Pass
5	Address	Enter the Address	Record valid	Record inserted	Pass
6	State/ City	Enter the registered location	Record valid	Record inserted	Pass
7	Home Phone Number	Enter the Home Phone Number with 10 numeric value	Record valid	Record inserted	Pass
8	Mobile Phone Number	Enter the Mobile Phone Number with 10 numeric value	Record valid	Record inserted	Pass
9	Date of Birth	Enter the Date of Birth with numeric value	Record valid if it's numeric value	Record inserted	Pass
10	Company	Enter the company	Record valid	Record inserted	Pass
11	Work Mobile Number	Enter the Work Mobile Number with 10 numeric value	Record valid	Record inserted	Pass
12	Extension No	Enter the Mobile Phone Number with 03 numeric value	Record valid	Record inserted	Pass
13	Employ Status(Active/ Inactive/ Resigned)	Select the relevant status	Record valid	Record inserted	Pass
14	Original Hire Date	Enter the Original Hire Date with numeric value	Record valid	Record inserted	Pass
15	Work Email	Enter the work Email address	Record valid	Record inserted	Pass
16	Personnel Email	Enter the Personnel Email address	Record valid	Record inserted	Pass

**Table 6 : Test Result - Employee Module**

## Appendix D : Use case Narratives

This table illustrates the send SMS and email use case in the system.

Use Case Name:	Send SMS or email to any registered user in the system	Use-Case Type – Business Requirement
Use Case ID:	02	
Priority:	High	
Source:	Document	
Primary Business Actor:	Administrator, Manager, Employee	
Description:	Administrator and Manger can send sms and emails to any system user. Employee can send sms or email to administrator and their manager only.	
Preconditions:	Internet facility, valid phone number and valid email address should be available.	
Trigger:	This use case is initiated after logging to the main page in the system and compose sms or email using the contact menu.	
Typical Course of events	System send the sms or email according to the user's requirement.	
Alternate Courses	None	
Post Conditions	None	

**Table 7 : Use Case Narrative for Send SMS or email**

Use Case Name :	Delete user details	Use-Case Type – Business Requirement
Use Case ID :	03	
Priority :	High	
Source :	System	
Primary Business Actor :	Administrator	
Other Participating Actors:	Manager	
Other Interested Stakeholders:	Employee	
Description:	Delete the entered user details with the permission of administrator	
Preconditions:	None	
Trigger:	None	
Typical Course of events	Actor Action	System Response
	Step 1: Administrator logging to the system.	step 2 : System validates user id and password
	Step 3: select the user details	Step 4: Display user details
	Step 4: select and delete the user to be deleted	Step 5: confirm the deletion
Alternate Courses	None	
Post Conditions	Delete confirm	

**Table 8 : Use Case Narrative for Delete user details**

Use Case Name :	Generate reports	Use-Case Type – Business Requirement
Use Case ID :	04	
Priority :	High	
Source :	System	
Primary Business Actor :	Administrator, Manager	
Other Participating Actors:	Employee	
Other Interested Stakeholders:	None	
Description:	Generate reports when required.	
Preconditions:	Enter required report type.	
Trigger:	When the required report is printing this use case is initiated.	
Typical Course of events	Actor Action	System Response
	Step 1: Administrator, Manager select the report type.	step 2 : System will display the type of report to be printed.
	Step 3: Administrator, Manager will enter the requirements needed to generate the report.	Step 4: Report will be printed.
Alternate Courses	Management decisions can be taken.	
Post Conditions	Generate reports	

**Table 9 : Use Case Narrative for Generate reports**

Use Case Name :	Search and View user details	Use-Case Type – Business Requirement
Use Case ID :	05	
Priority :	High	
Source :	System	
Primary Business Actor :	Administrator, Manager	
Other Participating Actors:	Employee	
Other Interested Stakeholders:	None	
Description:	View user details once user search the details.	
Preconditions:	Search users with using search function.	
Trigger:	When the required query is displaying this use case is initiated.	
Typical Course of events	Actor Action	System Response
	Step 1: Administrator, Manager search the required user details	step 2 : System will display the required user details
Alternate Courses	The employee has a facility to view availability.	
Post Conditions	Display the search details	

**Table 10 : Use Case Narrative for Search and View user details**