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**ANALYSIS AND IMPLEMATATION OF MEMBER SUBSCRIPTION AND CREDIT PAYMENT MANAGEMENT SYSTEM**

**CASE STUDY: SYTRAMORWA CREDIT AND MEMBER REGISTRATION DEPARTEMENT REMERA.**

Thesis Submitted in Partial Fulfillment

Of the Requirements for the Masters degree in

Internet System

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CHAP I. INTRODUCTION

This chapter aims to describe the background of the study, problem statement, research objectives, and significance of the study,structure of the study and scope of the study.

1.1. BACKGROUND OF THE STUDY

Information Technology is widely used and is rapidly becoming a common asset of modern socio-economic life in this new world. Our country Rwanda sees the use of Information and Communication Technologies (ICTs) as the key tool in transforming the economy[[1]](#footnote-2). Software development and the use of automated systems, network system development, the need to share resources within the country and the outside world, is what among other things that hold largely the degree of measure of development in the Rwandan society. Given the typical nature of Information Technology evolving day after day, there are wide ranges of activities that must be executed to Implement ICT strategic activities presented as interactive and online information. Among these activities, software development projects are made and put into action to reinforce the quest for automated Systems in companies, institutions, academic institutions and organizations.

SYTRAMORWA is a Cooperative for Rwandan motorcycle, mandated to empower the members towards raising their social-economic welfare and to contribute to socio-economic development of the community in which they live, was formed in January 2012 and it is legally accepted by the government law no 13/2009 of 25/05/2009 and published in Rwanda official gazette No 11 of 12/05/2012[[2]](#footnote-3).SYTRAMORWA has 7 branches in the country and over 5000 Members.

Today the management Activities of SYTRAMORWA is done manually by use of papers and pens, use of cupboards and use of paper holders It is not possible for the Members to get some of the services without going physically to the headquarter which not only takes more time but requires transport costs for some that can be even burdensome because whenever they go to the headquarter they have to be on long queues.so the following problems result in ineffectiveness and inefficient of this manual system.

Therefore, the computerized system became the effective and basic tool for the management of information. It is in this optics that thought of making a work which will contribute to the improvement of the management information system of SYTRAMORWA. The most important point about this computerized Management information System is that since technology came in to reduce a number of activities that can be done within a long time just is a limited time as possible, that is why such application is of a great role taking into account how effectively it will serve in reducing the time that the users of this SYTRAMORWA used to take while register Members on papers and keep information on papers. This Research has an objective to design and develop a software application that will be used to manage and control the information about this organization Activities, the report making by new system should play a big role in producing quality service in real time.

## 1.2 Problem statement

# The process of managing SYTRAMORWA member’s contribution, shares, credit request, credit payment, credit payment process, and credit punishment using paper based consumes long time, a lot of paper, data insecurity and transport costs that are incurred each time the member comes to the office for needed services.

In orderto solve the problems found in this existing system there is a need of developing analysis and implementation of member subscription and credit payment management system which is a new management system that delivers effective services on time and anywhere.

**1.3. Research objectives**

**1.3.1 General Objective**

The main objective of this research is analysis and design of management system which will manage the stored data about the membership in SYTRAMOWA cooperative and allow quick access to them when they are needed

**1.3.2 Specific Objectives**

* To study and critically analyzing the uses of paper based management system to store and manage the data of SYTRAMORWA.
* To present challenges about the old system while storing and managing the data of SYTRAMORWA
* To throw the solutions of above challenges by designing the management system to replace the old system as a result of using new system
* To designing the management system that will be used systematically for storing and managing SYTRAMORWA’s data

1.4. **Scope and limitation of project**

The scope of this project is limited to management of credit and member registration department of SYTRAMORWA. The cooperatives is a very important organization to the whole society, where different people gain many services from it such as Credit request, contributions payment, shares payment and others services are carry out in the cooperatives according to departments where credit and member registration is concerned .

This project will be only concerned with, management of credit and member registration department that will permit to register to database, getting the services by asking information easily wherever they are if they have access to the internet. The project is very broad reason why we have been limited to the SYTRAMORWA and others institutions particularly Cooperative use to manage their data.

**1.5. Significance of the study**

The design and analysis of this new management system help SYTRAMORWA to reduce consumption of a lot of paper, paper being torn, burnt from fire, destroyed by the rain, water or being lost or stolen while storing the data of members, Storing new information, deleting unnecessary information, modifying an existing information, search and display the required information easily and avoid data redundancy, inconsistency and immobility are reduced.

The design and analysis of this new management system will help the researchers gathering and fulfilling the objective of this research and applying the theoretical knowledge acquired during classroom study to solve real life practical problems. To develop and enhance computer skills and knowledge for the future

**1.6. Research Methodology**

In order to conduct this research the following method will be used for design, analysis and data collection of the research.

**The water fall model**

It is a sequential software development model (a process for creating software) in which Development is seen as flowing steadily downwards (like water fall) through the phases of Requirements analysis, design, testing (validation), deployment or implementation and Maintenance.

The requirement analysis and data collection from stakeholders related to the system is gathered using

**Interview**

This method will be used in order to interview SYTRAMORWA staff, members and some rangers in order to collect full data concern to the system.

**Observation**

This technique will be used in order to observing how the service of SYTRAMORWA to its members is offered in order to gather more data of the system

**Documentation**

This is the method will helps to refer to books, internet (website), magazines and findings of other researchers on the same subject of the project are consulted, memoirs related to the project and class notes from different lectures which will be clearly handled in chapter two, which is literature review.

**1.7 Structure of the project**

This project is divided into the following five chapters:

* The first chapter is a general introduction which contains background of study, problem statement, objectives of study, research methodology, and scope of study, and structureof the study.
* The second chapter presents literature review that defines different concepts, and management information system concept.
* The third chapter is concerned with research methodology.
* The fourth chapter is analysis and design of new system which includes the system requirements.
* The Fifth chapter is includes conclusion and recommendation.

**Conclusion**

The main point of this proposal has cover fist chapter which is general introduction and chapter tree which is research methodology.

**CHAPTER 2: LITERATURE REVIEW**

# 

# 2.1. INTRODUCTION

This chapter is about to define some important concepts and definitions used to develop this project work. It also describe the projects compared to ours done by other researchers in the same field in order to present the strengths, weaknesses as well as the similarities among both projects compared. Finally, it clarifies the personal contribution to the research conducted

# 2.2. THEORETICAL PERSPECTIVES

**2.2.1 Definition of key terms and concepts**

**2.2.1.1 Cooperative**

Is an autonomous association of persons who [voluntarily](http://en.wikipedia.org/wiki/Voluntary_association) cooperate for their mutual, social, economic, and cultural benefit? Cooperatives include non-profit community organizations and businesses that are owned and managed by the people who use its services (a consumer cooperative) or by the people who work there (a worker cooperative) or by the people who live there (a housing cooperative), hybrids such as worker cooperatives that are also consumer cooperatives or credit unions, multi-stakeholder cooperatives such as those that bring together civil society and local actors to deliver community needs, and second and third tier cooperatives whose members are other cooperatives[[3]](#footnote-4)

**2.2.1.2 Member**

One of the persons who compose a social group (especially individuals who have joined and participate in a group organization) “only members will be admitted"; "a member of the faculty"; "she was introduced to all the members of his family"[[4]](#footnote-5).

**2.2.1.3 Credit**

A [contractual](http://www.investorwords.com/9295/contractual.html) [agreement](http://www.investorwords.com/19249/agreement.html) in which a [borrower](http://www.investorwords.com/7518/borrower.html) receives something of [value](http://www.investorwords.com/5209/value.html) now and [agrees](http://www.investorwords.com/8794/agree.html) to [repay](http://www.investorwords.com/7199/repay.html) the [lender](http://www.investorwords.com/2767/lender.html) at some later date. When a [consumer](http://www.investorwords.com/1055/consumer.html) [purchases](http://www.investorwords.com/3952/purchase.html) something using a [credit card](http://www.investorwords.com/1199/credit_card.html), they are [buying](http://www.investorwords.com/12803/buyer.html) on credit ([receiving](http://www.investorwords.com/14717/receiver.html) the item at that time, and [paying](http://www.investorwords.com/3632/payer.html) [back](http://www.investorwords.com/8906/back.html) the credit [card](http://www.investorwords.com/9091/card.html) [company](http://www.investorwords.com/992/company.html) month by month). Any time when an individual [finances](http://www.investorwords.com/1940/finance.html) something with a [loan](http://www.investorwords.com/2858/loan.html) (such as an automobile or a [house](http://www.investorwords.com/2346/house.html)), they are using credit in that situation as well[[5]](#footnote-6).

**2.2.1.4 Motorcycle**

Is one of the most affordable forms of motorized transport in many parts of the world and, for most of the world's population, they are also the most common type of motor vehicle

**2.2.1.5 Contribution**

Imposed or [required](http://www.businessdictionary.com/definition/required.html) [payment](http://www.businessdictionary.com/definition/payment.html) or [Amount](http://www.businessdictionary.com/definition/amount.html) left over after direct (variable) costs are deducted from the [sales revenue](http://www.businessdictionary.com/definition/sales-revenue.html). Also [called](http://www.businessdictionary.com/definition/call.html) [gross income](http://www.businessdictionary.com/definition/gross-income.html), this [sum](http://www.businessdictionary.com/definition/sum.html) [pays](http://www.businessdictionary.com/definition/pay.html) for indirect (fixed) costs and [contributes](http://www.businessdictionary.com/definition/contribute.html) to [net income](http://www.businessdictionary.com/definition/net-income.html)[[6]](#footnote-7).

**2.2.1.6 Shares[[7]](#footnote-8)**

A [unit](http://www.businessdictionary.com/definition/unit.html) of [ownership](http://www.businessdictionary.com/definition/ownership.html) that [represents](http://www.businessdictionary.com/definition/represent.html) an equal [proportion](http://www.businessdictionary.com/definition/proportional.html) of a [company's](http://www.businessdictionary.com/definition/company.html) [capital](http://www.businessdictionary.com/definition/capital.html). It entitles its [holder](http://www.businessdictionary.com/definition/holder.html) (the [shareholder](http://www.businessdictionary.com/definition/shareholder.html)) to an equal [claim](http://www.businessdictionary.com/definition/claim.html) on the company's [profits](http://www.businessdictionary.com/definition/profit.html) and an equal [obligation](http://www.businessdictionary.com/definition/obligation.html) for the company's [debts](http://www.businessdictionary.com/definition/debt.html) and losses.

A part or portion of a larger amount which is divided among a number of people, or to which a number of people contribute.

One of the equal parts into which a company's capital is divided, entitling the holder to a proportion of the profits

**2.2.1.6 Payment[[8]](#footnote-9)**

The [partial](http://www.investorwords.com/10549/partial.html) or [complete](http://www.investorwords.com/9256/complete.html) [discharge](http://www.investorwords.com/1464/discharge.html) of an [obligation](http://www.investorwords.com/3373/obligation.html) by its [settlement](http://www.investorwords.com/4512/settlement.html) in the form of the [transfer](http://www.investorwords.com/5048/transfer.html) of [funds](http://www.investorwords.com/2130/funds.html), [assets](http://www.investorwords.com/273/asset.html), or [services](http://www.investorwords.com/6664/service.html) equal to the [monetary value](http://www.investorwords.com/6582/monetary_value.html) of part or all of the [debtor's](http://www.investorwords.com/1323/debtor.html) obligation. Compensation, [discharge](http://www.businessdictionary.com/definition/discharge.html) or [performance](http://www.businessdictionary.com/definition/performance.html) of an [obligation](http://www.businessdictionary.com/definition/obligation.html), or [reimbursement](http://www.businessdictionary.com/definition/reimbursement.html), by giving over something that is of satisfactory [value](http://www.businessdictionary.com/definition/value.html) to its [recipient](http://www.businessdictionary.com/definition/recipient.html), such as [money](http://www.businessdictionary.com/definition/money.html)

A payment is the transfer of an item of value from one [party](http://en.wikipedia.org/wiki/Party_%28law%29) (such as a person or company) to another in exchange for the provision of [goods](http://en.wikipedia.org/wiki/Good_%28accounting%29), [services](http://en.wikipedia.org/wiki/Service_%28economics%29) or both, or to fulfill a legal obligation.

The simplest and oldest form of payment is [barter](http://en.wikipedia.org/wiki/Barter), the exchange of one good or service for another. In the modern world, common means of payment by an individual include [money](http://en.wikipedia.org/wiki/Money), [cheque](http://en.wikipedia.org/wiki/Cheque), [debit](http://en.wikipedia.org/wiki/Direct_debit), [credit](http://en.wikipedia.org/wiki/Credit_%28finance%29), or [bank transfer](http://en.wikipedia.org/wiki/Bank_transfer), and in [trade](http://en.wikipedia.org/wiki/Trade) such payments are frequently preceded by an [invoice](http://en.wikipedia.org/wiki/Invoice) or result in a [receipt](http://en.wikipedia.org/wiki/Receipt). However, there are no arbitrary limits on the form a payment can take and thus in complex transactions between businesses, payments may take the form of [stock](http://en.wikipedia.org/wiki/Stock) or other more complicated arrangements.

**2.2.1.7 Punishment**

is the [authoritative](http://en.wikipedia.org/wiki/Authority) imposition of something undesirable or [unpleasant](http://en.wikipedia.org/wiki/Unpleasant) upon an individual or group by [law enforcement](http://en.wikipedia.org/wiki/Law_enforcement), in response to [behavior](http://en.wikipedia.org/wiki/Behavior) that an authority deems unacceptable or a violation of some [norm](http://en.wikipedia.org/wiki/Norm_%28social%29). The unpleasant imposition may include a [fine](http://en.wikipedia.org/wiki/Fine_%28penalty%29), [penalty](http://en.wikipedia.org/wiki/Sanctions_%28law%29), or [confinement](http://en.wikipedia.org/wiki/Imprisonment), or be the removal or denial of something pleasant or desirable. The individual may be a person. The authority may be either a group or a single person, and punishment may be carried out formally under a system of [law](http://en.wikipedia.org/wiki/Law) or informally in other kinds of social settings such as within a family[[9]](#footnote-10)

**2.2.1.8 Registration[[10]](#footnote-11)**

Registration –is the act of enrolling, enrolment incoming, ingress, entering, entrance, entry, the act of entering.

Registration - the body of people (such as students) who register or enroll at the same time enrollment body - a group of persons associated by some common tie or occupation and regarded as an entity; "the whole body filed out of the auditorium"; "the student body"; "administrative body".

Registration a document certifying an act of registering certificate, credential, certification and document attesting to the truth of certain stated facts.

Registration the act of adjusting something to match a standard read, adjustment calibration, standardization.

**2.2.1.9** **Membership**

Belonging, either individually or collectively, to a group. Some memberships may require a [fee](http://www.businessdictionary.com/definition/fee.html) to join or participate while some do not. Others, as in the case of MENSA, have specific [skill](http://www.businessdictionary.com/definition/skill.html) [requirements](http://www.businessdictionary.com/definition/requirements.html) that must be reached [prior](http://www.businessdictionary.com/definition/prior.html) to be accepted into the group. Special [privileges](http://www.businessdictionary.com/definition/privilege.html) or [benefits](http://www.businessdictionary.com/definition/benefit.html) are [entitled](http://www.businessdictionary.com/definition/entitled.html) to [members](http://www.businessdictionary.com/definition/member.html) although not all members may have the same [rights](http://www.businessdictionary.com/definition/right.html) and privileges[[11]](#footnote-12).

2.**2.2 Information system and fundamentals**

**2.2.2.1 System[[12]](#footnote-13)**

System whole compounded of several parts or members, system", literary "composition" is a set of interacting or interdependent components forming an integrated whole.

A system is a set of elements and relationships which are different from relationships of the set or its elements to other elements or sets.

Fields that study the general properties of systems include systems theory, cybernetics, dynamical systems, thermodynamics and complex systems. They investigate the abstract properties of systems' matter and organization, looking for concepts and principles that are independent of domain, substance, type, or temporal scale.

Most systems share common characteristics, including:

* Systems have structure, defined by components and their composition;
* Systems have behavior, which involves inputs, processing and outputs of material, energy, information, or data;
* Systems have interconnectivity: the various parts of a system have functional as well as structural relationships to each other.
* Systems may have some functions or groups of functions

**2.2.2.2 Information System**

A [combination](http://www.businessdictionary.com/definition/combination.html) of [hardware](http://www.businessdictionary.com/definition/hardware.html), [software](http://www.businessdictionary.com/definition/software.html), [infrastructure](http://www.businessdictionary.com/definition/infrastructure.html) and trained [personnel](http://www.businessdictionary.com/definition/personnel.html) [organized](http://www.businessdictionary.com/definition/organized.html) to facilitate [planning](http://www.businessdictionary.com/definition/planning.html), [control](http://www.businessdictionary.com/definition/control.html), [coordination](http://www.businessdictionary.com/definition/coordination.html), and [decision making](http://www.businessdictionary.com/definition/decision-making.html) in an [organization](http://www.businessdictionary.com/definition/organization.html)[[13]](#footnote-14).

**2.2.2.3 Management information system**

A management information system (MIS) is a computerized database of financial information organized and programmed in such a way that it produces regular reports on operations for every level of management in a company. It is usually also possible to obtain special reports from the system easily. The main purpose of the MIS is to give managers feedback about their own performance; top management can monitor the company as a whole. Information displayed by the MIS typically shows "actual" data over against "planned" results and results from a year before; thus it measures progress against goals. The MIS receives data from company units and functions. Some of the data are collected automatically from computer-linked check-out counters; others are keyed in at periodic intervals. Routine reports are preprogrammed and run at intervals or on demand while others are obtained using built-in query languages; display functions built into the system are used by managers to check on status at desk-side computers connected to the MIS by networks[[14]](#footnote-15).

**2.2.2.4 Information technology**

Information technology (IT) is the application of [computers](http://en.wikipedia.org/wiki/Computer) and [telecommunications equipment](http://en.wikipedia.org/wiki/Telecommunications_equipment) to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise. The term is commonly used as a synonym for computers and computer networks, but it also encompasses other [information](http://en.wikipedia.org/wiki/Information) distribution technologies such as television and telephones. Several [industries](http://en.wikipedia.org/wiki/Computer_industry) are associated with information technology, including [computer hardware](http://en.wikipedia.org/wiki/Computer_hardware), [software](http://en.wikipedia.org/wiki/Software), [electronics](http://en.wikipedia.org/wiki/Electronics), [semiconductors](http://en.wikipedia.org/wiki/Semiconductors), [internet](http://en.wikipedia.org/wiki/Internet), [telecom equipment](http://en.wikipedia.org/wiki/Telecommunications_equipment), [e-commerce](http://en.wikipedia.org/wiki/E-commerce) and computer services[[15]](#footnote-16).

Stands for "Information Technology," and is pronounced "I.T." It refers to anything related to computing technology, such as networking, hardware, software, the Internet, or the people that work with these technologies. Many companies now have IT departments for managing the computers, networks, and other technical areas of their businesses. IT jobs include computer programming, network administration, computer engineering, Web development, technical support, and many other related occupations. Since we live in the "information age," information technology has become a part of our everyday lives. That means the term "IT," already highly overused, is here to stay[[16]](#footnote-17).

**2.2.2.5. Computer Software[[17]](#footnote-18)**

Computer software is a general term that describes computer programs. Related terms such as software programs, applications, scripts, and instruction sets all fall under the category of computer software. Therefore, [installing](http://www.techterms.com/definition/install) new programs or applications on your computer is synonymous with installing new software on your computer.

Software can be difficult to describe because it is "virtual," or not physical like computer [hardware](http://www.techterms.com/definition/hardware). Instead, software consists of lines of code written by computer programmers that have been compiled into a computer program. Software programs are stored as [binary](http://www.techterms.com/definition/binary) data that is copied to a computer's [hard drive](http://www.techterms.com/definition/harddrive), when it is installed. Since software is virtual and does not take up any physical space, it is much easier (and often cheaper) to upgrade than computer hardware.

While at its most basic level, software consists of binary data, [CD-ROMs](http://www.techterms.com/definition/cdrom), [DVDs](http://www.techterms.com/definition/dvd), and other types of media that are used to distribute software can also be called software. Therefore, when you buy a software program, it often comes on a disc, which is a physical means of storing the software

**2.2.3. Database concepts**

# 2.2.3.1. Data

Computer data is information processed or stored by a computer. This information may be in the form of text documents, images, audio clips, software programs, or other types of data. Computer data may be processed by the computer's [CPU](http://www.techterms.com/definition/cpu) and is stored in [files](http://www.techterms.com/definition/file) and [folders](http://www.techterms.com/definition/folder) on the computer's [hard disk](http://www.techterms.com/definition/harddisk)[[18]](#footnote-19).

# 2.2.3.2. Database[[19]](#footnote-20)

A database is a data structure that stores organized information. Most databases contain multiple tables, which may each include several different fields. For example, a company database may include tables for products, employees, and financial records. Each of these tables would have different fields that are relevant to the information stored in the table.

Nearly all [e-commerce](http://www.techterms.com/definition/ecommerce) sites use databases to store product inventory and customer information. These sites use a database management system (or [DBMS](http://www.techterms.com/definition/dbms)), such as Microsoft Access, FileMaker Pro, or [MySQL](http://www.techterms.com/definition/mysql) as the "back end" to the website. By storing website data in a database, the data can be easily searched, sorted, and updated. This flexibility is important for e-commerce sites and other types of [dynamic websites](http://www.techterms.com/definition/dynamicwebsite).

Early databases were relatively "flat," which means they were limited to simple rows and columns, like a [spreadsheet](http://www.techterms.com/definition/spreadsheet). (See also "[flat file database](http://www.techterms.com/definition/flatfile)"). However, today's relational databases allow users to access, update, and search information based on the relationship of data stored in different tables. Relational databases can also run queries that involve multiple databases. While early databases could only store text or numeric data, modern databases also let users store other [data types](http://www.techterms.com/definition/datatype) such as sound clips, pictures, and videos.

# 2.2.3.3. Database system

Database system is a general term that refers to the combination of a database, a database management system and a data model. This system is responsible for the following data manipulation acts; data controlling, data retrieving, data maintenance and data definition.[[20]](#footnote-21)

# 2.2.3.4. Database management system[[21]](#footnote-22)

A database management system (DBMS) is a collection of [programs](http://www.webopedia.com/TERM/P/program.html) that enables you to [store](http://www.webopedia.com/TERM/S/store.html), modify, and extract information from a [database](http://www.webopedia.com/TERM/D/database.html). There are many different types of DBMSs, ranging from small [systems](http://www.webopedia.com/TERM/S/system.html) that [run](http://www.webopedia.com/TERM/R/run.html) on [personal computers](http://www.webopedia.com/TERM/P/personal_computer.html) to huge systems that run on [mainframes](http://www.webopedia.com/TERM/M/mainframe.html). The following are examples of [database applications](http://www.webopedia.com/TERM/D/database_management_system_DBMS.html):

* computerized library systems
* automated teller machines
* flight reservation systems
* computerized parts inventory systems

# 2.2.3.5 Data Modelling[[22]](#footnote-23)

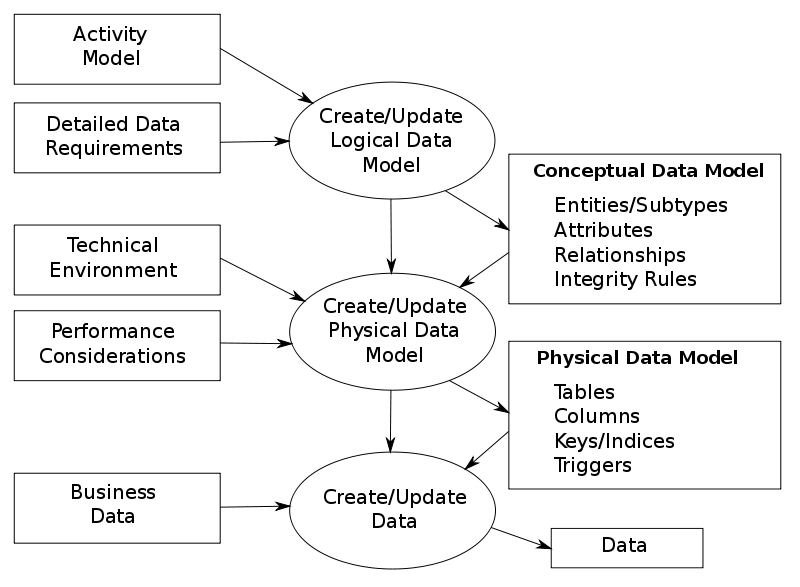
Data modeling in [software engineering](http://en.wikipedia.org/wiki/Software_engineering) is the process of creating a [data model](http://en.wikipedia.org/wiki/Data_model) for an [information system](http://en.wikipedia.org/wiki/Information_system) by applying formal data modeling techniques.

Data modeling is a [process](http://en.wikipedia.org/wiki/Software_development_process) used to define and analyze data [requirements](http://en.wikipedia.org/wiki/Requirement) needed to support the [business processes](http://en.wikipedia.org/wiki/Business_process) within the scope of corresponding information systems in organizations. Therefore, the process of data modeling involves professional data modelers working closely with business stakeholders, as well as potential users of the information system.

There are three different types of data models produced while progressing from requirements to the actual database to be used for the information system. The data requirements are initially recorded as a [conceptual data model](http://en.wikipedia.org/wiki/Conceptual_schema) which is essentially a set of technology independent specifications about the data and is used to discuss initial requirements with the business stakeholders. The [conceptual model](http://en.wikipedia.org/wiki/Conceptual_modeling) is then translated into a [logical data model](http://en.wikipedia.org/wiki/Logical_data_model), which documents structures of the data that can be implemented in databases. Implementation of one conceptual data model may require multiple logical data models. The last step in data modeling is transforming the logical data model to a [physical data model](http://en.wikipedia.org/wiki/Physical_data_model) that organizes the data into tables, and accounts for access, performance and storage details. Data modeling defines not just data elements, but also their structures and the relationships between them.

Data modeling techniques and methodologies are used to model data in a standard, consistent, predictable manner in order to manage it as a resource. The use of data modeling standards is strongly recommended for all projects requiring a standard means of defining and analyzing data within an organization, e.g., using data modeling:

* to assist business analysts, programmers, testers, manual writers, IT package selectors, engineers, managers, related organizations and clients to understand and use an agreed semi-formal model the concepts of the organization and how they relate to one another
* to manage data as a resource
* for the integration of information systems
* for designing databases/data warehouses (aka data repositories)

 4-3 Data Modeling Today

2.2.3.6 **Entity**

An entityis an object that exists and is distinguishable from other objects.[[23]](#footnote-24)

2.2.3.7 **Entity Relationship Diagram[[24]](#footnote-25)**

An entity-relationship (ER) diagram is a specialized graphic that illustrates the [relationships between entities in a database](http://databases.about.com/od/specificproducts/a/Database-Relationships-An-Introduction-To-Foreign-Keys-Joins-And-E-R-Diagrams.htm). ER diagrams often use symbols to represent three different types of information.

**A) One-to-one relationship :** occur when each entry in the first at table has one , and only one , counterpart in the second table to one to one relationship are rarely used because it is often more efficient to simply put all of the Information in single table .

B) **One-to-many relationship**: Is the most common type of database relationship. They occur when each record in the first table corresponds to only one record in the first table.

C)**Many to many relationship**: occur when each record in the first table correspond to one or more record in the second table and each record in the second table correspond to one or more records in the first table.

2.2.3.8 **Table[[25]](#footnote-26)**

A table is a data structure that organizes information into [rows](http://www.techterms.com/definition/row) and [columns](http://www.techterms.com/definition/column). It can be used to both store and display data in a structured format. For example, [databases](http://www.techterms.com/definition/database) store data in tables so that information can be quickly accessed from specific rows. [Websites](http://www.techterms.com/definition/website) often use tables to display multiple rows of data on page. [Spreadsheets](http://www.techterms.com/definition/spreadsheet) combine both purposes of a table by storing and displaying data in a structured format. Databases often contain multiple tables, with each one designed for a specific purpose. For example, a company database may contain separate tables for employees, clients, and suppliers. Each table may include its own set of fields, based on what [data](http://www.techterms.com/definition/data) the table needs to store. In database tables, each field is considered a column, while each entry (or record), is considered a row. A specific value can be accessed from the table by requesting data from an individual column and row.

**2.2.3.9** **Record**

A record is a generic term of a row in database, just like a card. A record very often represents a piece of content. The dynamic functionality and much of the content of Mambo relies in a database in order to function

**2.2.3.10** **Field**

In the [structure](http://www.businessdictionary.com/definition/structure.html) of a [database](http://www.businessdictionary.com/definition/database.html), the smallest [component](http://www.businessdictionary.com/definition/component.html) under which [data](http://www.businessdictionary.com/definition/data.html) is entered through [data capture](http://www.businessdictionary.com/definition/data-capture.html) or [data entry](http://www.businessdictionary.com/definition/data-entry.html). All data fields in the same database have unique [names](http://www.businessdictionary.com/definition/names.html), several data fields make up a data record, several [data records](http://www.businessdictionary.com/definition/data-record.html) make up a data file, and several [data files](http://www.businessdictionary.com/definition/data-file.html) make up a database[[26]](#footnote-27).

**2.2.3.11** **Attribute**

An entity is represented by a set of attributes that is descriptive properties possessed by all members of an entity set[[27]](#footnote-28).

### 2.2.3.12 Primary key

The primary key is used to create relationships between tables. It's «the entry keyed off of» to identify the record in question. An otherwise meaningless surrogate value is often used for the primary key. The primary key for an entry must never change: if the referred to by a record in a different table, the relationship (link) will be often irretrievably broken[[28]](#footnote-29)

### 2.2.3.13. Foreign key

In the context of relational databases, a foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table. In other words, a foreign key is a column or a combination of columns that is used to establish and enforce a link between two tables[[29]](#footnote-30).

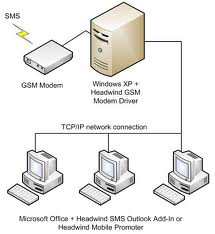
**2.2.2.13 Database design**

The process of creating a design for a database that will support the enterprise’s operations and objectives[[30]](#footnote-31) .

2.2.4 **Network environment**

**2.2.4.1 Client/server architecture[[31]](#footnote-32)**

Client-server architecture, Architecture of a computer [network](http://www.britannica.com/EBchecked/topic/130637/computer-network) in which many [clients](http://www.britannica.com/EBchecked/topic/121476/client) (remote processors) request and receive service from a centralized [server](http://www.britannica.com/EBchecked/topic/535947/server) (host computer). Client computers provide an interface to allow a computer user to request services of the [server](http://www.britannica.com/EBchecked/topic/535947/server) and to display the results the server returns. Servers wait for requests to arrive from clients and then respond to them. Ideally, a server provides a standardized transparent interface to clients so that clients need not be aware of the specifics of the system (i.e., the [hardware](http://www.britannica.com/EBchecked/topic/255132/hardware) and [software](http://www.britannica.com/EBchecked/topic/552496/software)) that is providing the service.



2.2.4.2 **Client-server[[32]](#footnote-33)**

Client/server describes the relationship between two computer programs in which one program, the client, makes a service request from another program, the server, which fulfills the request. Although the client/server idea can be used by programs within a single computer, it is a more important idea in a network. In a network, the client/server model provides a convenient way to interconnect programs that are distributed efficiently across different locations. Computer transactions using the client/server model are very common. For example, to check your bank account from your computer, a client program in your computer forwards your request to a server program at the bank. That program may in turn forward the request to its own client program that sends a request to a [database](http://searchsqlserver.techtarget.com/definition/database) server at another bank computer to retrieve your account balance. The balance is returned back to the bank data client, which in turn serves it back to the client in your personal computer, which displays the information for you

**2.2.4.3 Database server[[33]](#footnote-34)**

The term database server may refer to both hardware and software used to run a database, according to the context. As software, a database server is the back-end portion of a database application, following the traditional client-server model. This back-end portion is sometimes called the instance. It may also refer to the physical computer used to host the database. When mentioned in this context, the database server is typically dedicated higher-end computers that host the database. Note that the database server is independent of the database architecture. Relational databases, flat files, non-relational databases: all these architectures can be accommodated on database servers

**2.2.4.4 Web server[[34]](#footnote-35)**

Web server can refer to either the hardware (the computer) or the software (the computer application) that helps to deliver content that can be accessed through the internet. The most common use of Web servers is to host Web sites but there are other uses like data store the primary function of a web server is to deliver web pages on the request to clients. This means delivery of HTML documents and any additional content that may be included by a document, such as images, style sheets and JavaScript.

A client, commonly a web browser or web crawler, initiates communication by making a request for a specific resource using HTTP and the server responds with the content of that resource or an error message if unable to do so. The resource is typically a real file on the server's secondary memory, but this is not necessarily the case and depends on how the web server is implemented. Many generic web servers also support server -side scripting, e.g.,

Apache HTTP Server and PHP. This means that the behavior of the web server can be scripted in separate files, while the actual server software remains unchanged. Usually, this function is used to create HTML documents "on-the-fly" as opposed to returning fixed documents. This is referred to as dynamic and static content respectively. The former is primarily used for retrieving and/or modifying information from databases. The latter is, however, typically much faster and more easily cached.

Web servers are not always used for serving the world wide web. They can also be found embedded in devices such as printers, routers webcams and serving only a local network. The web server may then be used as a part of a system for monitoring and/or administrating the device in question. This usually means that no additional software has to be installed on the client computer; since only a web browser is required (which now is included with most operating systems).



**2.2.4.5 Web Browser**

A web browser is a [software application](http://en.wikipedia.org/wiki/Software_application) for retrieving, presenting and traversing information resources on the [World Wide Web](http://en.wikipedia.org/wiki/World_Wide_Web). An information resource is identified by a [Uniform Resource Identifier](http://en.wikipedia.org/wiki/Uniform_Resource_Identifier) and may be a [web page](http://en.wikipedia.org/wiki/Web_page), image, video or other piece of content[[35]](#footnote-36)

**2.2.4.6 Web page[[36]](#footnote-37)**

A web page or webpage is a resource of information that is suitable for the World Wide Web and can be accessed through a web browser. This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links. Web pages may be r retrieved from a local computer or from a remote web server. The web server restricts access only to a private network.

**2.2.4.7 Website[[37]](#footnote-38)**

A website, also written Web site, web site, or simply site, is a collection of related web pages containing images, videos or digital assets. A website is hosted on at least one web server, accessible via a network such as the internet or a private local area network through an Internet address known as a Uniform Resource Locator. All publicly accessible websites collectively constitute the World Wide Web. A web page is a document, typically written in plain text interspersed with formatting instructions of Hypertext Markup Language (HTML, XHTML). A web page may incorporate elements from other websites with suitable markup anchors. The pages of a website can usually be accessed from a simple Uniform Resource Locator (URL) called the homepage. The URLs of the pages organize them into a hierarchy, although hyper linking between them conveys the reader's perceived site structure and guides the reader's navigation of the site

**2.2.4.8 Web Application**

A Web application is a software application utilizing the web platform to accomplish one or more tasks[[38]](#footnote-39).

**2.2.5 Tools and Language used**

**2.2.5.1 HTML[[39]](#footnote-40)**

HTML, which stands for HyperText Markup Language, is the predominant markup language for web pages. HTML is the basic building-blocks of web pages.

HTML is written in the form of HTML elements consisting of tags, enclosed in angle brackets (like <html>), within the web page content. HTML tags normally come in pairs like <h1> and </h1>. The first tag in a pair is the start tag, the second tag is the end tag (they are also called opening tags and closing tags). In between these tags web designers can add text, tables, images, etc.

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

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

**2.2.5.2 PHP[[40]](#footnote-41)**

PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML

Instead of lots of commands to output HTML (as seen in C or Perl), PHP pages contain HTML with embedded code that does "something" (in this case, output "Hi, I'm a PHP script!"). The PHP code is enclosed in special [start and end processing instructions <?php and ?>](http://www.php.net/manual/en/language.basic-syntax.phpmode.php) that allow you to jump into and out of "PHP mode."

What distinguishes PHP from something like client-side JavaScript is that the code is executed on the server, generating HTML which is then sent to the client. The client would receive the results of running that script, but would not know what the underlying code was. You can even configure your web server to process all your HTML files with PHP, and then there's really no way that users can tell what you have up your sleeve.

The best things in using PHP are that it is extremely simple for a newcomer, but offers many advanced features for a professional programmer. Don't be afraid reading the long list of PHP's features. You can jump in, in a short time, and start writing simple scripts in a few hours.

Although PHP's development is focused on server-side scripting, you can do much more with it. Read on, and see more in the [hat can PHP do?](http://www.php.net/manual/en/intro-whatcando.php) Section, or go right to the [introductory tutorial](http://www.php.net/manual/en/tutorial.php) if you are only interested in web programming.

**2.2.5.3 Mysql[[41]](#footnote-42)**

MySQL is an open source relational database management system ([RDBMS](http://searchsqlserver.techtarget.com/definition/relational-database-management-system)) based on Structured Query Language ([SQL](http://searchsqlserver.techtarget.com/definition/SQL)).

MySQL runs on virtually all platforms, including [Linux](http://searchenterpriselinux.techtarget.com/definition/Linux), [UNIX](http://searchenterpriselinux.techtarget.com/definition/Unix), and [Windows](http://searchwindowsserver.techtarget.com/definition/Windows). Although it can be used in a wide range of applications, MySQL is most often associated with web-based applications and online publishing and is an important component of an [open source](http://searchenterpriselinux.techtarget.com/definition/open-source) enterprise stack called [LAMP](http://searchenterpriselinux.techtarget.com/definition/LAMP). LAMP is a Web development platform that uses [Linux](http://searchenterpriselinux.techtarget.com/definition/Linux) as the operating system, [Apache](http://searchcio-midmarket.techtarget.com/definition/Apache) as the Web server, [MySQL](http://searchenterpriselinux.techtarget.com/definition/MySQL) as the relational database management system and [PHP](http://searchenterpriselinux.techtarget.com/definition/PHP) as the object-oriented scripting language. (Sometimes [Perl](http://searchenterpriselinux.techtarget.com/definition/Perl) or [Python](http://searchenterpriselinux.techtarget.com/definition/Python) is used instead of PHP.)

MySQL, which was originally conceived by the Swedish company MySQL AB, was acquired by [Oracle](http://searchoracle.techtarget.com/definition/Oracle) in 2008.  Developers can still use MySQL under the GNU General Public License ([GPL](http://searchenterpriselinux.techtarget.com/definition/General-Public-License)), but enterprises must obtain a commercial license from Oracle

**2.2.5.5 JavaScript[[42]](#footnote-43)**

Like Java, this is a programming language designed by Sun Microsystems, in conjunction with Netscape that can be integrated into standard HTML pages. While JavaScript is based on the Java syntax, it is a scripting language, and therefore cannot be used to create stand-alone programs. Instead, it is used mainly to create dynamic, interactive Web pages. For example, Web developers can use JavaScript to validate form input, create image rollovers, and to open those annoying pop-up windows. Like so many other things, we have to take the good with the bad

**2.2.5.4 Apache server[[43]](#footnote-44)**

Apache Web Server is open source Web server creation, deployment and management software. Initially developed by a group of software programmers, it is now maintained by the Apache Software Foundation

Apache Web Server is designed to create Web servers that have the ability to host one or more HTTP-based websites. Notable features include the ability to support multiple programming languages, server side scripting, an authentication mechanism and database support. Apache Web Server can be enhanced by manipulating the code base or adding multiple extensions.

It is also widely used by Web hosting companies for the purpose of providing shared/virtual hosting, as by default, Apache Web Server supports and distinguishes between different hosts that reside on the same machine

**2.2.5.6 CSS[[44]](#footnote-45)**

Stands for "Cascading Style Sheet." Cascading style sheets are used to format the layout of [Web pages](http://www.techterms.com/definition/webpage). They can be used to define text styles, table sizes, and other aspects of Web pages that previously could only be defined in a page's [HTML](http://www.techterms.com/definition/html).

CSS helps Web developers create a uniform look across several pages of a Web site. Instead of defining the style of each table and each block of text within a page's HTML, commonly used styles need to be defined only once in a CSS document. Once the style is defined in cascading style sheet, it can be used by any page that references the CSS file. Plus, CSS makes it easy to change styles across several pages at once. For example, a Web developer may want to increase the default text size from 10pt to 12pt for fifty pages of a Web site. If the pages all reference the same style sheet, the text size only needs to be changed on the style sheet and all the pages will show the larger text.

While CSS is great for creating text styles, it is helpful for formatting other aspects of Web page layout as well. For example, CSS can be used to define the cell padding of table cells, the style, thickness, and color of a table's border, and the padding around images or other objects. CSS gives Web developers more exact control over how Web pages will look than HTML does. This is why most Web pages today incorporate cascading style sheets.

# 2.3. RELATED CASE STUDIES

**2.3.1 Introduction**

This section explains in deep strengths, weaknesses, similarities and personal contribution within both projects work compared.

**2.3.2 Management information system of subscription member and recruitment for employee’s transparency Rwanda**

In analysis and design of our project, we used to consult the project done by MBONIGABA Franck entitled” Management information system of subscription member and recruitment for employees” student at INILAK 2013.He design and implement that project to assist Transparency Rwanda in management of member subscription and contribution.

In such approach I found this topic in the same way with mine because my work is analysis and implementation of member subscription and credit payment management system, which will aid SYTRAMORWA and Cooperative institution to manage easily its credit and member registration department data.

#### 2.3.2.1 Strengths

The Management information system of subscription member and recruitment for employees present many reward over "real life" in transparency Rwanda that enable to register member and manage their contribution. Another improvement of Management information system of subscription member and recruitment for employees is that it is easier to search, update, and delete unneeded information and records containing details member data.

#### 2.3.2.2 Weaknesses

The most general disadvantages with Management information system of subscription member and recruitment for employees are that the system is local where users cannot access the service online.

### 2.3.2.3 Similarities

The both projects show some similarity in management of subscription of members

**2.6**.2 **Personal contribution**

As personal contribution to the research conducted, we try to advance SYTRAMORWA and others cooperative to manage and store data in helpful online database and access to them quickly and effectively as possible wherever they are.

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