# 4. System Analysis

## 4.1 Introduction

It is a process of collecting and interpreting facts, identifying the problems, and decomposition of a system into its components. System analysis is conducted for the purpose of studying a system or its parts in order to identify its objectives. It is a problem solving technique that improves the system and ensures that all the components of the system work efficiently to accomplish their purpose.

This activity further enables the analyst to further identify some additional requirements which the user needs and thus incorporate the same in the construction of the new system. This is further realized in the data collection process where the additional information is gathered from the respective stakeholders. System analysis answers the questions of who will use the system, what the system will do and where and when it will be used.

## 4.2 Problem Specification

Security is a crucial part of our lives. With the technological advancement during the past decades security has stopped to be about protecting physical assets only but also the intangible ones. We need a security guard to protect the bank but we also need “security guards” to protect our passwords. People can masquerade to be different people hence stealing without anyone noticing. Authentication solves this as it verifies user credentials for a named user. The task is therefore to come up with an application that allows for this kind of online access control using OTP to personalize such online access, which is more secure than static passwords. Access

control systems are responsible for authenticating and authorizing users to access

content in the system.

#### 4.2.1 Feasibility study

A feasibility study is carried out to select the best system that meets performance requirements.  
The main aim of the feasibility study activity is to determine whether it would be financially and technically feasible to develop the product. The feasibility study activity involves the analysis of the problem and collection of all relevant information relating to the product such as the different data items which would be input to the system, the processing required to be carried out on these data, the output data required to be produced by the system as well as various constraints on the behavior of the system.

The following techniques were used to carry out the systems feasibility study:

#### 4.2.2 Technical Feasibility

This is concerned with specifying equipment and software that will successfully satisfy the user requirement. The technical needs of the system may vary considerably. It is about being familiar with the system. The analyst of the application is familiar with the web based Applications area and OTP. Therefore, there is a lesser chance of misunderstanding the user needs or missing opportunities for improvement.

Familiarity with the technology: The developer is familiar with web application development and thus there are lesser chances that problems will occur and delays are incurred because of the need to learn how to use the technology.

#### 4.2.3 Operational Feasibility

Operational feasibility is the measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. From the users’ feedback, the system was deemed to be operationally feasible as it improved on the security of user .

#### 4.2.4 Economical Feasibility

A project is considered economically feasible when the benefits that will accrue to the broad community are greater than the cost of undertaking the project. It includes identification and quantification of all benefits projected. It answered the following question: 1.Will users derive an economic benefit from the proposed system? 2. Will the cost of implementation be justifiable? The system will enable users derive an economic benefit as they can sell their research papers online.

# 4.3 System Analysis

## 4.3.1 Requirement Analysis

Requirement Analysis is the process of defining user expectations for a new software being built or modified. Requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project, taking account of the possibly conflicting requirements of the various stakeholders, analyzing, documenting, validating and managing software or system requirements. The software requirements were

Identified by analyzing existing systems and online. Three organizations were selected for case study as common application platforms sometimes uses OTP but not always.

#### 4.4 Requirement specification

A requirement is a condition or capability to which a system must conform. Requirements may fit into one of the following categories:

1. Functional requirements. They specify actions that a system must be able to perform, without taking physical constraints into consideration.
2. Non-functional requirements. Many requirements are non-functional, and describe only attributes of the system or attributes of the system environment. They are often categorized as usability, reliability, performance.

#### 4.5 Functional Requirements

1. Generate one-time password: send One-time password SMS to the user’s mobile phone for all money transfer, payment and etc. that are done through internet banking.

2. User should be able to register an account.- The system should allow various users to create accounts

3. User should be able to receive SMS through their registered mobile number.

4. The mobile should be able to synchronize with the server.

5. The system should be able to deny access to unauthenticated users.

#### 4.6 Non-functional Requirements

1. Availability -Application’s availability, or ”uptime,” is the amount of time that it is operational and available for use . The timeliness in the process of producing and sending the OTP
2. Efficiency -Specifies how well the software utilizes scarce resources: CPU cycles, disk space, memory, bandwidth, etc.
3. Flexibility - If the organization intends to increase or extend the functionality of the application after it is deployed, that should be planned from the beginning, it influences choices made during the design, development, testing, and deployment of the application.
4. Usability - Ease-of-use requirements address the factors that constitute the capacity of the application to be understood, learned, and used by its intended users.
5. Security - refers to how secure the system is in terms of allowing only specific people to access the system at specific times. The requirements include:

a. The users of the system can only access specific information in the web based application.

b. The users cannot be able to modify data related to other users, though they can modify data about them .

1. Accessibility : The user interface will be responsive to cater for the devices that users might have to access the system.

# 5. System design

## 5.1 Introduction

System design  the process of defining the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system.

This chapter describes how the system or program should meet the customer’s′ needs and how to make system effective and efficient. During the system design we identify the data relationships and the database schema elements. The design also seeks to define how the user will interact with the system and the desired system user interfaces

#### 5.2 Architectural design

The architectural design of a system emphasizes the design of the [system architecture](https://en.wikipedia.org/wiki/System_architecture) that describes the [structure](https://en.wikipedia.org/wiki/Structure), [behavior](https://en.wikipedia.org/wiki/Behavior) and more [views](https://en.wikipedia.org/wiki/View_model) of that system and analysis.

In this design we are going to look at the behavioral models.

#### 5.2 .1Behavioral Modeling

Behavioral models describe the internal dynamic aspects of the system that supports the business processes in an organization. It describes what the internal logic of the processes is. In this chapter, we describe Unified Modeling Language (UML) diagram that is used in behavioral modeling (sequence diagram).

#### 5.2.2 Sequence diagram



Figure 1

#### 5.3.1 Logical design

The logical design of a system pertains to an abstract representation of the data flows, inputs and outputs of the system. This is often conducted via modeling, using an over-abstract (and sometimes graphical) model of the actual system. In the context of systems, designs are included. Logical design includes [entity-relationship diagrams](https://en.wikipedia.org/wiki/Entity%E2%80%93relationship_model) (ER diagrams).

#### 5.3.2Entity relationship diagram

Figure 2

#### 5.4.1Physical design

The physical design relates to the actual input and output processes of the system. This is explained in terms of how data is input into a system, how it is verified or authenticated, how it is processed, and how it is displayed.

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5.5.1 Human Computer Interaction Layer Design

The human computer interface layer defines the way in which the users will interact with the system and the nature of the inputs and outputs that the system accepts and produces.

#### 5.5.2 (Put a screenshot of the login page)