IMAGE STEGANOGRAPHY

PROJECT REPORT SUBMITTED TO MAHATMA GANDHI UNIVERISITY, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER APPLICATIONS

BY

NAVYA XAVIER

170021093399

DEPT. OF COMPUTER SCIENCE

B.V.M HOLY CROSS COLLEGE

CHERPUNKAL, KOTTAYAM 686 584

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DEPARTMENT OF COMPUTER SCIENCE

BVM HOLY CROSS COLLEGE CHERPUNKAL

Certificate

Certified that the report entitled "Image Steganography" is the bonafide record of the main-project work done by Ms. NAVYA XAVIER(Reg.No.170021093399) under our guidance and supervision and is submitted in partial fulfillment of the Bachelor degree in Computer Applications, awarded by Mahatma Gandhi University, Kerala.

Mrs. Salmiya AA — Project Guide

Mr. Binu M B — Head of the Department

Rev. Fr. N.V. Joseph

Principal

Submitted for Project Evaluation on ------/-----/-----

External Examiner

DECLARATION

I hereby declare that the project work entitled Image Steganography submitted in partial fulfillment of the requirements for the award of the Bachelor of degree in Computer Applications from BVM Holy Cross College, Cherpunkal, is record of bonafide work done under the guidance of Mrs. Nija Michael IPSR Guide, Technical consultant and Mrs. Salmiya AA Assistant Professor, Department Of Computer Science.

Place: Cherpunkal NAVYA XAVIER

Date: 170021093399

ACKNOWLEDGMENT

It gives me immense pleasure to express heartful thanks to all those who helped me in the successful completion of this project works. It has been said that gratitude is the memory of heart. First of all I would like to thank the God Almighty who has been a constant support in every walk of my life and the source of strength in presenting this project work.

Words are boundless to express my sincere thanks to my most respected principal, Rev. Fr. Joseph Njarakkattil, whose advice was really an encouragement for me.

I am very much thankful to Mr. Binu M.B (Head of Department, Computer Science), for his proper guidance, encouragement and timely suggestions throughout my project work. I also express my gratitude to Mrs. Nija Michael(Technical consultant, IPSR solutions) for her proper guidance and support throughout this project. I also express my special thanks to Mrs. Salmiya AA (Assistant Professor, Department of Computer Science) and to all teachers in the Department of Computer Science, who has helped me in the completion of this project.

And also I wish to express my deep sense of gratitude to my parents and friends for the support and co-operation they rendered to me in making this work ease. And I express my sincere thanks to all who have helped me to complete my project.

ABSTRACT

Image steganography is the process of hiding an image within another image. In this way we can keep our personal images safe from hacking by others. When a third party is viewing the image that is uploaded they only can view the image that is covered not the hided image. The image in which we hide the personal image is called the cover image.

The image steganography project system consist of only one module: user. User can only enter to the system by filling up a registration form. After filling the registration form user can login into the system by entering the email id and password. When user logins there is two options for the user: encrypt photos and decrypt photos. In encrypt photos user can upload a cover image and the personal image to be hidden and it will be encrypted. In decrypt photos user can decrypt the hidden image inside the cover image and has an option to delete the uploaded image.

Contents

1. INTRODUCTION

1.1 PROJECT OVERVIEW

The project titled “Image Steganography” is aimed at providing a safe storage of personal images in a photo gallery or photo uploading website. In this system or project we are using an image to cover our personal image. The image within which we hide our personal image is called cover image. The image that is to be hidden is called secret image.

In this system there consist of only a single module which is the user. When the user enters into the system he/she can upload their images. First they want to select an image as the cover image and then the next image will be the secret image and the system will encrypt or hide the secret image inside the cover image. The size of the cover image should be greater than the secret image. The user also have the provision to decrypt the encrypted image. The encrypted image will be displayed in the gallery. Anyone who visit this system does not know that an image is hidden inside the cover image. They can only view the cover image not the hidden image.

1.2 ORGANIZATION PROFILE

Burst is a free stock photo platform that is powered by shopify. Their image library includes thousands of high-resolution, royalty-free images that were shot by their global community of photographers. They built burst to provide designers, developers, bloggers and entrepreneurs with access to beautiful free stock photography. They allow users to use their pictures for just about anything- website, blog or online store, school projects, instagram ads, facebook posts, desktop backgrounds, client work and more. All their photos are free for commercial use with no attribution required.

The burst is a site where user can download or upload photos which can then be used by them or others. The site also provides business suggestions with links to suppliers that are not affiliated or endorsed by shopify.

To access and use the website and to download or upload photos, user may be requested to provide a valid email address and set up an account(a “burst account”). In order to upload photos user will be required to provide name, email address and any other information identified as being required.

2. SYSTEM CONFIGURATION

2.1 HARDWARE SPECIFICATION

Minimum Hardware requirement are specified below:

- Processor: Intel CORE i3 8th Gen
- RAM: 4.00 GB
- System type:64 bit OS

2.2 SOFTWARE SPECIFICATION

The Software specifications are:

- OPERATING SYSTEM : WINDOWS 10
- FRONT-END : HTML, CSS (Form design)

  : Django(Coding)
- BACK-END : MySQL
- WEB SERVER : Mozilla Firefox ,Google Chrome

Operating system is the software responsible for allocating resources, including memory, processor, timer, disk space and peripheral devices such as printer and monitor. All application programs are using the operating system to gain access to these resources, as they are needed. Popular operating systems are WINDOWS, UNIX, and LINUX etc.

The operating system provides certain services to program and to users of these programs such as program execution, input-output operation, calculation, resources allocation etc.

3. SYSTEM ANALYSIS

Structured analysis is a document method for analysis of existing system manual or automated system leading to development of specification for new or modified system. When system analyst approaches an unfamiliar situation there is always a question of how to begin the analysis. A dynamic situation may seem almost over because so many activities are going on. Structured analysis allows analyst to learn about a system or process in manageable and logical way while providing a basis for ensuring that pertinent details do not get overlooked.

The underlying object in structured analysis is to organize the tasks associated with requirements determination to provide an accurate and complete understanding of a current situation. From this concept, requirements are determined which all meet the basis for new modified systems.

3.1 PRELIMINARY INVESTIGATION

Preliminary investigation is a problem solving activity that requires intensive communication between the system users and system developers. It does various feasibility studies. In these studies, a rough figure of the system activities can be obtained, from which the decisions about the strategies to be followed for effective system study and analysis can be taken.

At the preliminary investigation an initial picture about the system working is got from this study, the data collection methods were identified. Right from the investigation about the system many existing drawbacks of the system could be identified, which helped a lot in the later stages of more rigorous study and analysis of the manual system. The most critical phase of managing system projects is planning. To launch a system investigation, we need a master plan detailing the steps to be taken, the people to be questioned, and the outcome expected.

3.2 THE EXISTING SYSTEM

The image steganography does not consists of an existing system. Nowadays we are all familiar with uploading images in websites and other social media such as facebook, instagram, twitter etc. Uploading is the process of moving digital files such as photographs or documents from computer and placing them on to a central server so that someone else can retrieve them or to a website so others can see them.

DRAWBACKS OF EXISTING SYSTEM

- Image uploaded will be hacked by someone.
- Our personal images can be misused.
- Security issues will be existing.
- Privacy will be lost.

3.3 PROPOSED SYSTEM

The proposed image steganography system is a system that offers a safe way of uploading images in the website or in any other photo gallery. Personal images can be stored in a better way as compared to existing system by hiding the image in another image.

PROPOSED SYSTEM OBJECTIVES

- To deliver a system that meets the requirement of the users in photo uploading.
- To help the users to upload their secret images safely and efficiently.

SCOPE AND BENEFITS OF THE PROPOSED SYSTEM

Members will receive better and quick service.

1. Security is ensured by protecting the system with password.
2. Normalization database tables eliminate data inconsistency.
3. Accuracy and user friendliness.

FEATURES OF THE PROPOSED SYSTEM

1. User friendly

   This package is easy to use.
2. Security

   The uploaded secret image cannot be hacked by a third party because they did not know that a secret image is hidden in the cover image. They only can view the cover image.
3. Ease of installation

   Being a package solution, it is easy to install. The software is installed in the hard disk.

3.4 FEASIBILITY ANALYSIS

Feasibility study is carried out to determine whether the proposed system can be developed with available resources. There are three steps;

- Economic feasibility
- Technical feasibility
- Behavioral feasibility

ECONOMIC FEASIBILITY

It is the most frequent used method for evaluating the efficiency and effectiveness of the candidate system. Here proposed system can be considered of the economically feasible, if it has advantages over other candidate systems and its benefits exceed cost. In this case alternative are to here to use manual systems, to buy a software package, or continue with the existing system, or to develop a new system which suits needs. After considering these candidate systems, it decided to develop a new system that has high benefits rates over cost.

TECHNICAL FEASIBILITY

Technical feasibility centers around the existing system and to what extend it can support the proposal addition. It involves manual consideration to accommodate technical enhancements. If the budget is serious constraint, then the project is judged not feasible. The development of system in technology will have the following advantages.

1. New system needs less storage space.
2. It can produce quick and up-to-date error free reports.
3. It avoids data inconsistency.
4. It provides full security on confidential data.

BEHAVIOURAL FEASIBILITY

People are inherently resistant to the changes and the computers have been made of how strong a reaction the user staff is likely to have towards the development of a computerized system. The hierarchy of the new system is very easier than the existing system. The new system is user friendly and operational cost is bearable. The maintenance and working of the new system needs less effort.

3.5 ADVANTAGES OF PROPOSED SYSTEM

- Image upload can be made easily and fast.
- Image retrieval is also easy.
- Less manpower required.
- To deliver a system that meets the requirement of the user in image uploading.
- To help the user to upload their images safely without being hacked by anyone.

3.6 REQUIREMENT SPECIFICATION

WINDOWS 10

Windows 10 is a series of operating systems produced by Microsoft and released as part of its Windows NT family of operating systems. It is the successor to Windows 8.1, released nearly two years earlier, and was released to manufacturing on July 15 2015, and broadly released for retail sale on July 29, 2015. Windows 10 receives new builds on an ongoing basis, which are available at no additional cost to users, in addition to additional test builds of Windows 10 which are available to Windows Insiders. Devices in enterprise environments can receive these updates at a slower pace, or use long-term support milestones that only receive critical updates, such as security patches, over their ten- year lifespan of extended support.

DJANGO

Django is a python based free and open source web framework, which follows the model-template-view(MTV) architectural pattern. It is maintained by the Django Software Foundation(DSF), an independent organization established as a 501©(3) non-profit.

Django's primary goal is to ease the creation of complex, database-driven websites. The framework emphasizes reusability and pluggability of components, less code, low coupling, rapid development, and the principle of don't repeat yourself. Python is used throughout, even for settings files and data models. Django also provides an optional administrative create, read, update and delete interface that is generated dynamically through introspection and configured via admin models.

Some well- known sites that use django include the public broadcasting service, Instagram, Mozilla, The Washington Times, Disqus, Bitbucket and Nextdoor. It was used on Pinterest, but later the site moved to a framework built over Flask.

Despite having its own nomenclature, such as naming the callable objects generating the HTTP responses views, the core django framework can be seen as an MVC architecture. It consists of an object-relational mapper(ORM) that mediates between data models (defined as python classes) and a relational database("model"), a system for processing HTTP requests with a web - templating system("view"), and a regular-expression based URL dispatcher("controller").

Also included in the core framework are:

- A lightweight and standalone web server for development and testing

- A form serialization and validation system that can translate between HTML forms and values suitable for storage in the database
- A template system that utilizes the concept of inheritance borrowed from object-oriented programming
- A caching framework that can use any of several cache methods
- Support for middleware classes that can intervene at various stages of request processing and carry out custom functions
- An internal dispatcher system that allows components of an application to communicate events to each other via pre-defined signals
- An internationalization system, including translations of django's own components into a variety of languages
- A serialization system that can produce and read xml and/or JSON representations of django model instances
- A system for extending the capabilities of the template engine
- An interface to python's built in unit test framework
- Django REST framework is a powerful and flexible toolkit for building web APIs

MySQL

MySQL is an open-source relational database management system (RDBMS). Its name is a combination of "My", the name of co-founder Michael Widenius'sdaughter, and "SQL", the abbreviation for Structured Query Language.

MySQL is free and open-source software under the terms of the GNU General Public Licenseand is also available under a variety of proprietary licenses. MySQL was owned and sponsored by the Swedish company MySQL AB, which was bought by Sun Microsystems (now Oracle Corporation).In 2010, when Oracle acquired Sun, Widenius forked the open-source MySQL project to create MariaDB.

MySQL is a component of the LAMP web application software stack (and others), which is an acronym for Linux, Apache, MySQL, Perl/PHP/Python. MySQL is used by many database-driven web applications, including Drupal, Joomla, phpBB, and WordPress. MySQL is also used by many popular websites, including Facebook, Flickr, Media-Wiki, Twitter, and YouTube.

4. SYSTEM DESIGN

4.1 INTRODUCTION

System design specifies the creation of new system. The important phase composed of several steps it provides the understanding and procedural details necessary for implementing the system recommended in the initial study. The purpose of design stage is plan a solution for the problem specified by the requirement document. The design of the system is the most important factor affecting the quality of the system and has a major impact on the testing and the implementation phases. The design of a system is essentially a blue print, or a plan for solution for the system.

The two operational design objectives are system reliability and maintainability. A system is said to be reliable if it does not produce dangerous or costly failure when it is used in reasonable manner. During design analysis must take necessary steps to ensure that maintenance is controlled.

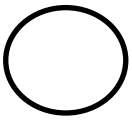
4.2 SYSTEM FLOW CHART

The classical system flowchart approach to describing and documenting a system will be presented. These system flowchart are also used in the structured approach that is, form the general to detailed, of the system development life cycle. Because they have been used to describe system for many years, they are still common in many businesses. System flow charts are of two types: Process Oriented flowchart and Information Oriented Flow chart**.**

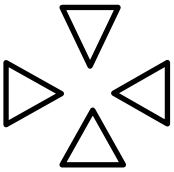
Basic Flow Chart Symbols

Process

Input-output

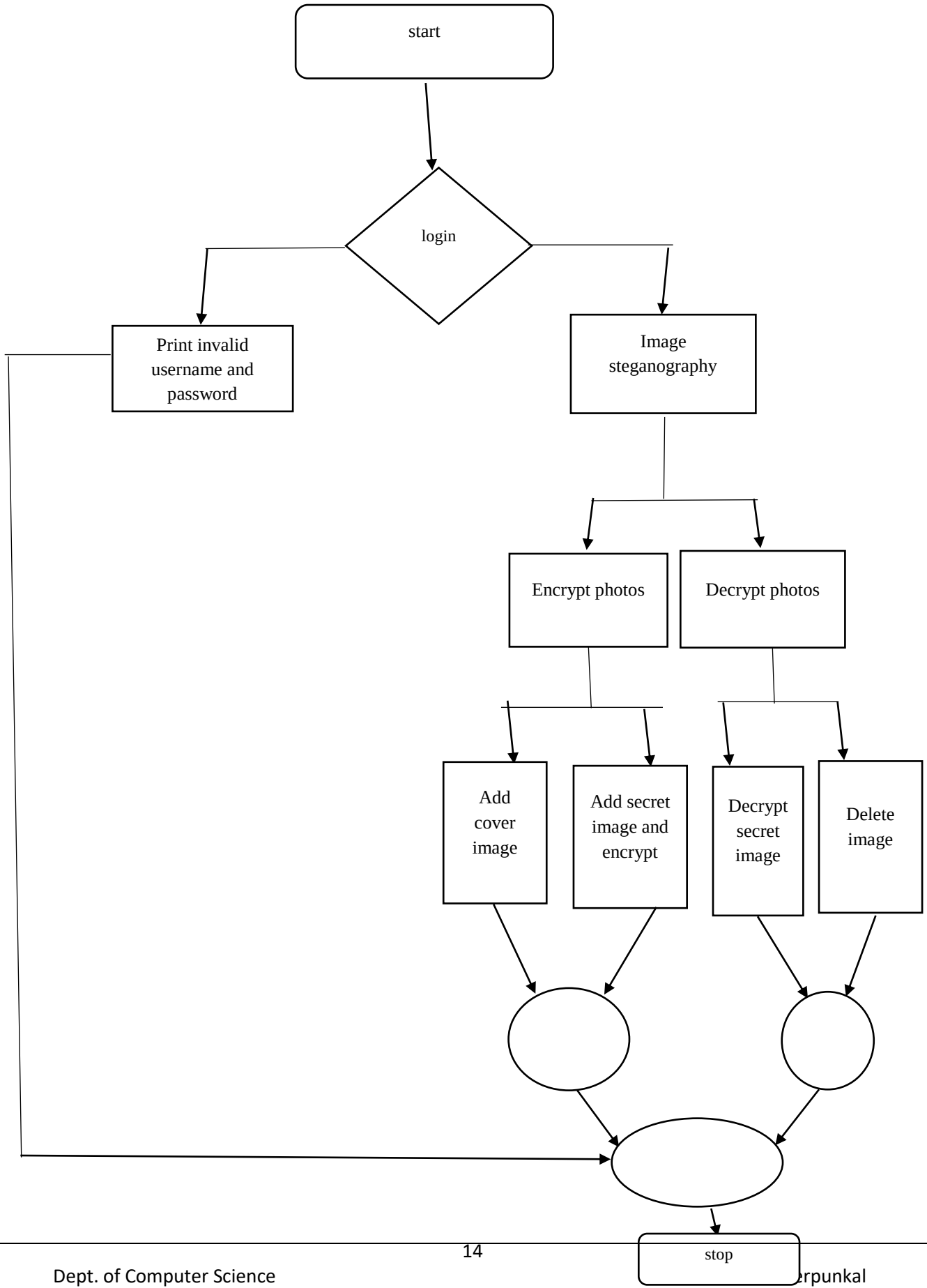


Connector



Arrow header

Off-connector


start
login
Print invalid username and password
Image steganography
Encrypt photos
Decrypt photos
Add cover image
Add secret image and encrypt
Decrypt secret image
Delete image
stop

4.3 DATABASE DESIGN

The design is another important concern of a project. Here tables play a major role. In our proposed system, tables are used to keep track of user details and uploaded image information. While designing tables there are so many things to remember. Among them most important one is that they must be evaluated with methods of normalization and integrity constraints. Here we have remembered one that something normalization method may create problem that can never be cured.

TABLES

Photo

Field name	Datatype	Width	Description
id	int	11	image id
Image1	varchar	100	Cover image
Image2	varchar	100	Secret image
eimage	varchar	100	Encrypted image
dimage	varchar	100	Decrypted image
userId_id	int	11	Id of user who upload image

Primary key: id.

user

Field Name	Data Type	Width	Description
id	int	11	User id
name	varchar	30	Name of user
email	varchar	40	Email of user
password	varchar	70	Password of user
gender	varchar	10	Gender of user
profession	varchar	30	profession

Primary key:id

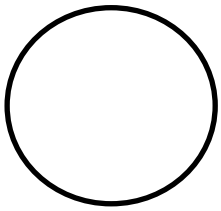
4.4 DATA FLOW DIAGRAM

A data flow diagram is the best and easiest tool to represent the flow of the data in the project. It is otherwise known as bubble chart. It has the purpose of clarifying system requirements and identifying major transformations that will become programs in the system design. It is the major starting point in the design phase that functionally decomposes the requirements specifications down to the lowest level of detail. A DFD consists of a series of bubbles joined by lines. The bubble represents data flow in the system. In the normal convention a DFD has four major symbols.

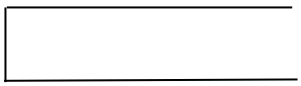
1. A Square defines source or destination of data.

2. An Arrow shows data flow.

3. A Circle represents a process that transforms incoming data into outgoing data flows

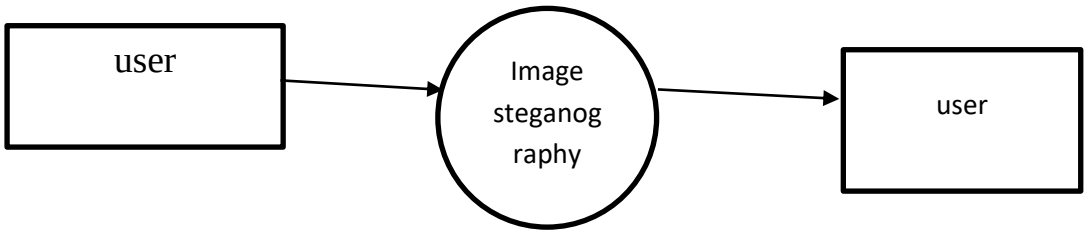


4. An Open rectangle shows a data store

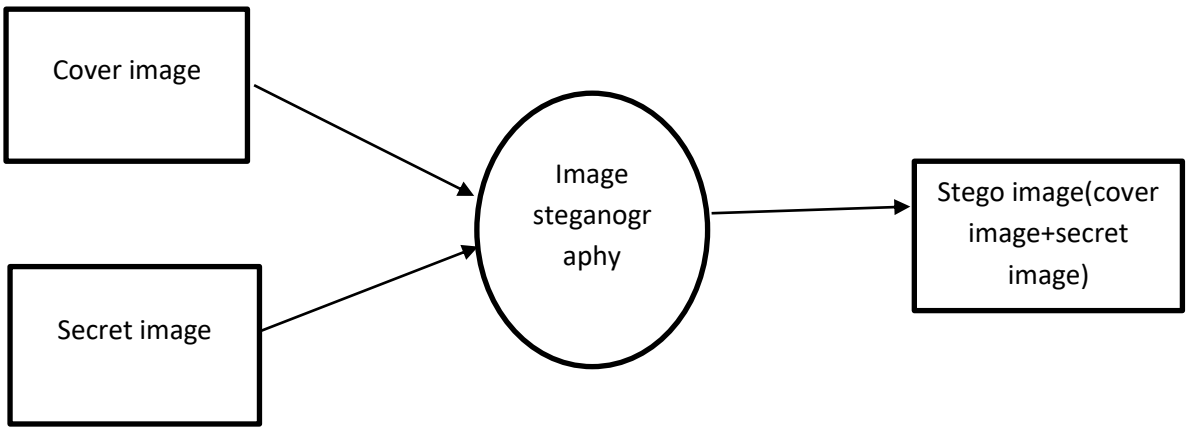


DFD OF THE PROJECT

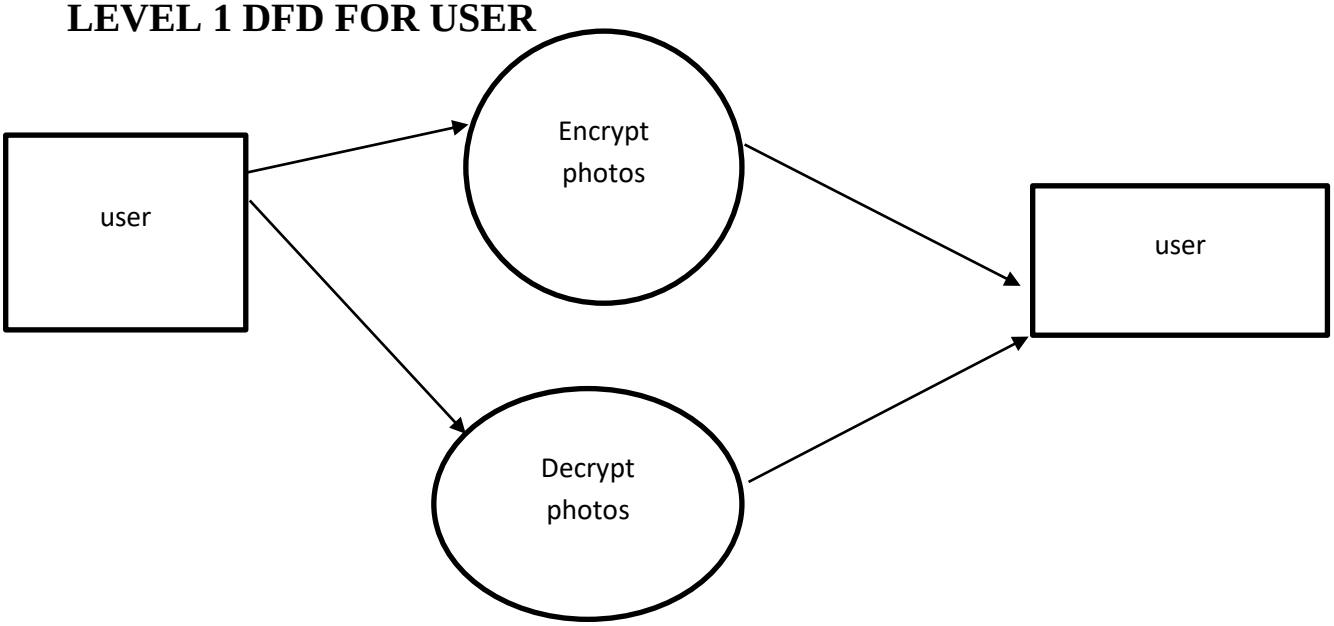
Context Diagram



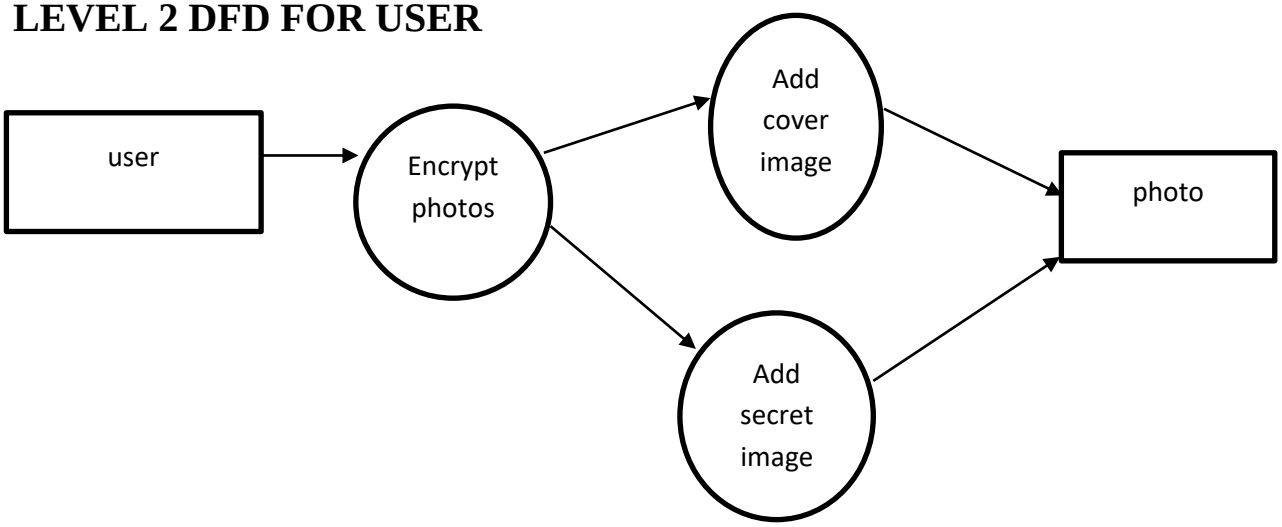
LEVEL 0 FOR USER

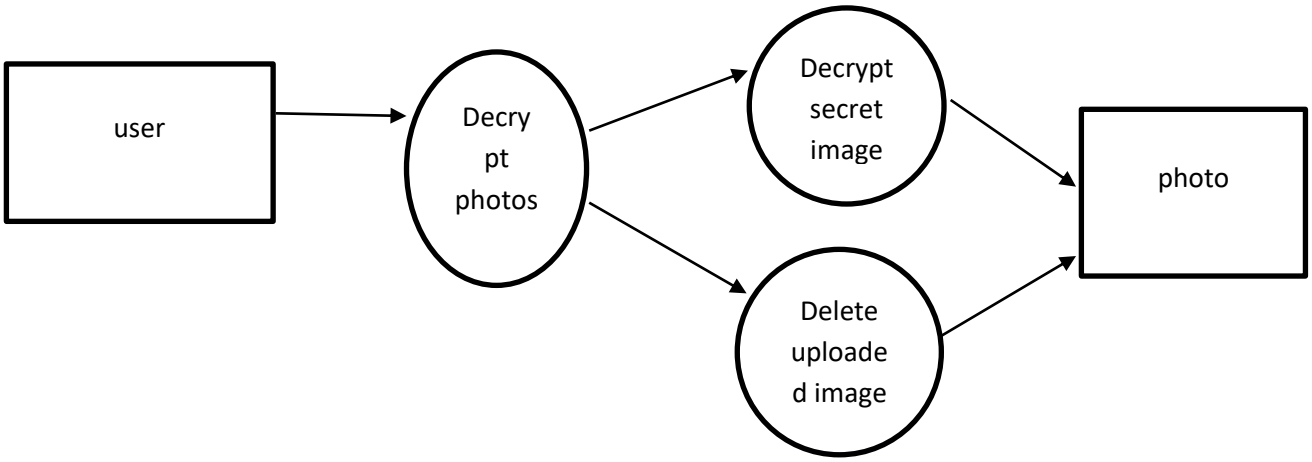


LEVEL 1 DFD FOR USER



LEVEL 2 DFD FOR USER





4.5 INPUT DESIGN

Another most important design aspect of a system is the input design. Here we design the input that our new proposed system is going to take. Since we are developing a system with less complexity and very easy to programming language like python, we can design the input of our system in django with helps of HTML forms and basic controls on what we understood in the system analysis.

4.6 OUTPUT DESIGN

One of the important design aspects of a system is the output design. Here we design the output that our new proposed system is going to produce. Since we are developing a new system with less complexity and very easy to programming language like python, we can design the output of our system in django with help of CSS&HTML basic controls based on what we understood in the system analysis.

5. SYSTEM DEVELOPMENT

5.1 INTRODUCTION

The project is developed to assist the users in minimizing the time and to safely upload their photos on website or any other photo gallery without being hacked by anyone. The Image Steganography System made for hiding secret images. This software efficiently handles the data and provides security to the data stored in the data base. The project is a modular template system with the unique decision of having a simple, user friendly environment.

5.2 MENU LEVEL DESCRIPTION

The project development to assist the users in minimizing the time and manpower required to upload their photos or images without being hacked by anybody in an organization, This project is a modular template system with the unique distinction of having a simple, user friendly environment. This means users do not need any programming knowledge. A set of template will be defined in the software to create an initial view, she/he can then use the simple management interface to control the software and perform their own activities.

Encrypt photos: In this section user can upload their secret images along with the image within which this image should be hidden.

Decrypt photos: In this section user can decrypt their secret image from the cover image and also have the option to delete the uploaded image.

5.3 PROCESS SPECIFICATION

The “Image steganography” manages the secret images uploaded by the users to be hidden from others who are viewing the system. The user adds a cover image and along with it the secret image will be hidden inside it or is encrypted. The size of the cover image should be greater than the size of the image to be hidden or secret image otherwise it is not possible to hide the image in another image. User also have the provision to decrypt the images and can view the hidden image separately. The system also enables the user to delete or remove the uploaded image from the gallery.

6. SYSTEM TESTING

Final testing performed is the system testing. After all modules are integrated to our system, system is checked for completeness. Here system will be free of syntactic errors, we mainly focused to find out the uncover requirements.

6.1 TESTING METHODS

System testing is an expensive but critical process. Since various things of system are tested there must be various level of testing. In our project Image steganography has mainly three testing.

6.2 TEST PLAN ACTIVITIES

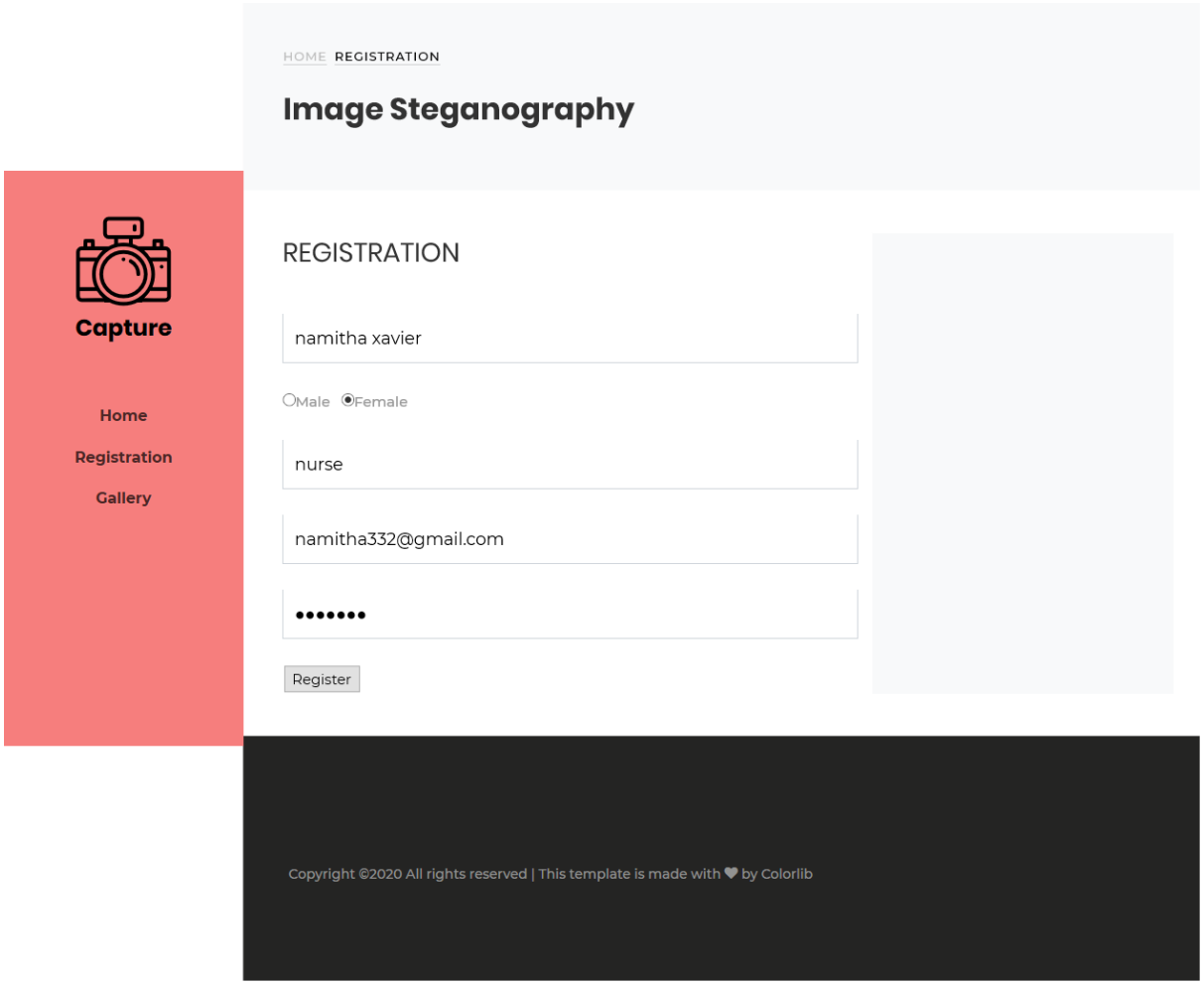
UNIT TESTING

Unit testing is performed at all units. (Sub division of module). When an error either logical or syntactical occurs; we write and mask the unit error free. Normally unit testing is performed at time of writing code of that particular unit itself.

INTEGRATION TESTING

The entire testing sub modules are integrated to module and module to system. During the process of integration, integrated module are tested ensure that the entire component are working well and produce the desired output. When an error either logical or syntactic occurs, we write the code and make the unit error free.

6.3 SCREEN LAYOUTS



Capture

Home

Registration

Gallery

HOME

Image Steganography

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Reiciendis, eius mollitia suscipit, quisquam doloremque distinctio perferendis et doloribus unde architecto optio laboriosam porro adipisci sapiente officiis nemo accusamus ad praesentium? Esse minima nisi et. Dolore perferendis, enim praesentium omnis, iste doloremque quia officia optio deserunt molestiae voluptates soluta architecto tempora.

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LOGIN

Email Id

Password

login

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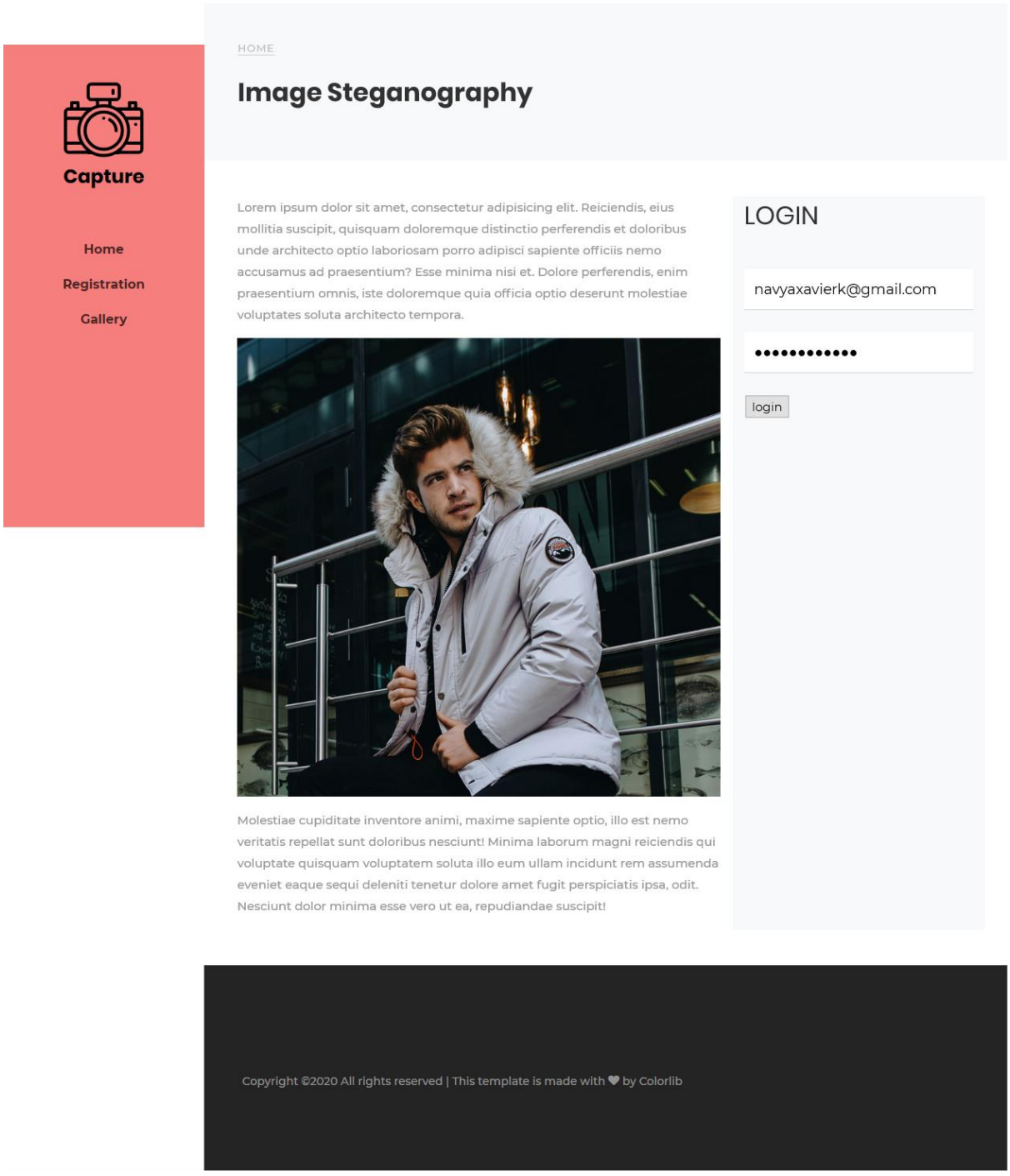
Capture
Home
Registration
Gallery
HOME
Image Steganography
Lorem ipsum dolor sit amet, consectetur adipisicing elit. Reiciendis, eius mollitia suscipit, quisquam doloremque distinctio perferendis et doloribus unde architecto optio laboriosam porro adipisci sapiente officiis nemo accusamus ad praesentium? Esse minima nisi et. Dolore perferendis, enim praesentium omnis, iste doloremque quia officia optio deserunt molestiae voluptates soluta architecto tempora.
LOGIN
navyaxavierk@gmail.com
login
Molestiae cupiditate inventore animi, maxime sapiente optio, illo est nemo veritatis repellat sunt doloribus nesciunt! Minima laborum magni reiciendis qui voluptate quisquam voluptatem soluta illo eum ullam incidunt rem assumenda eveniet eaque sequi deleniti tenetur dolore amet fugit perspiciatis ipsa, odit. Nesciunt dolor minima esse vero ut ea, repudiandae suscipit!
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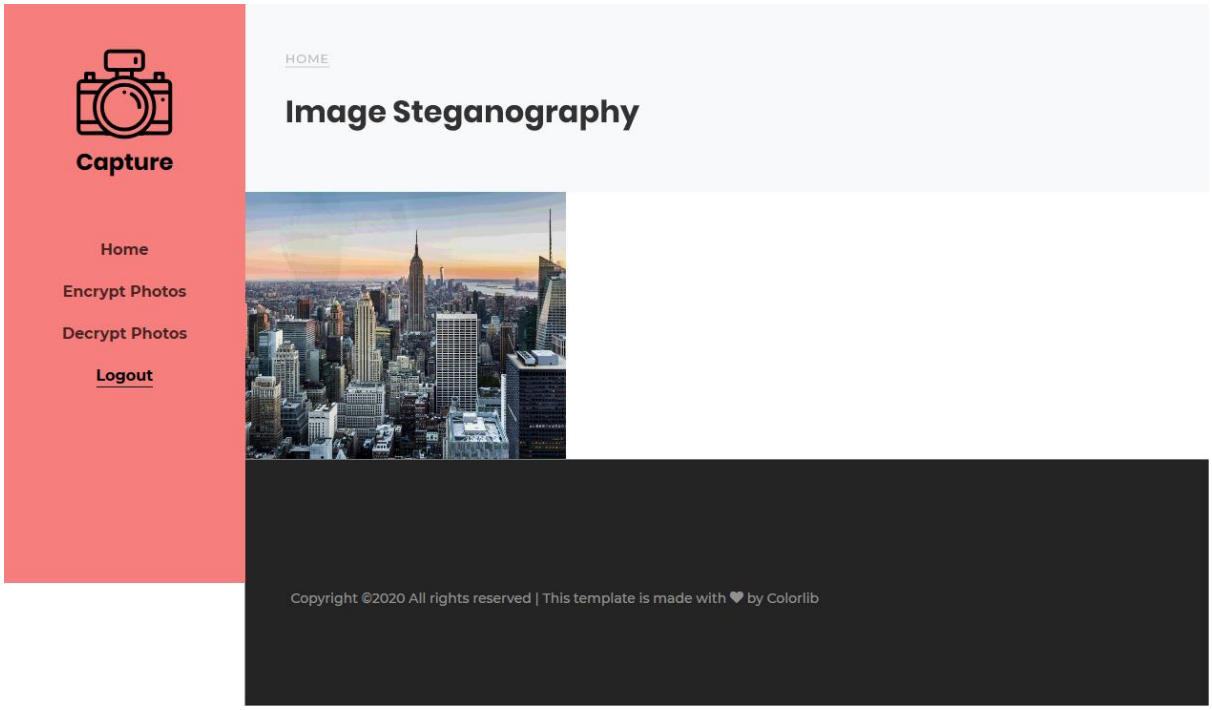
Capture
Home
Encrypt Photos
Decrypt Photos
Logout
HOME
Image Steganography
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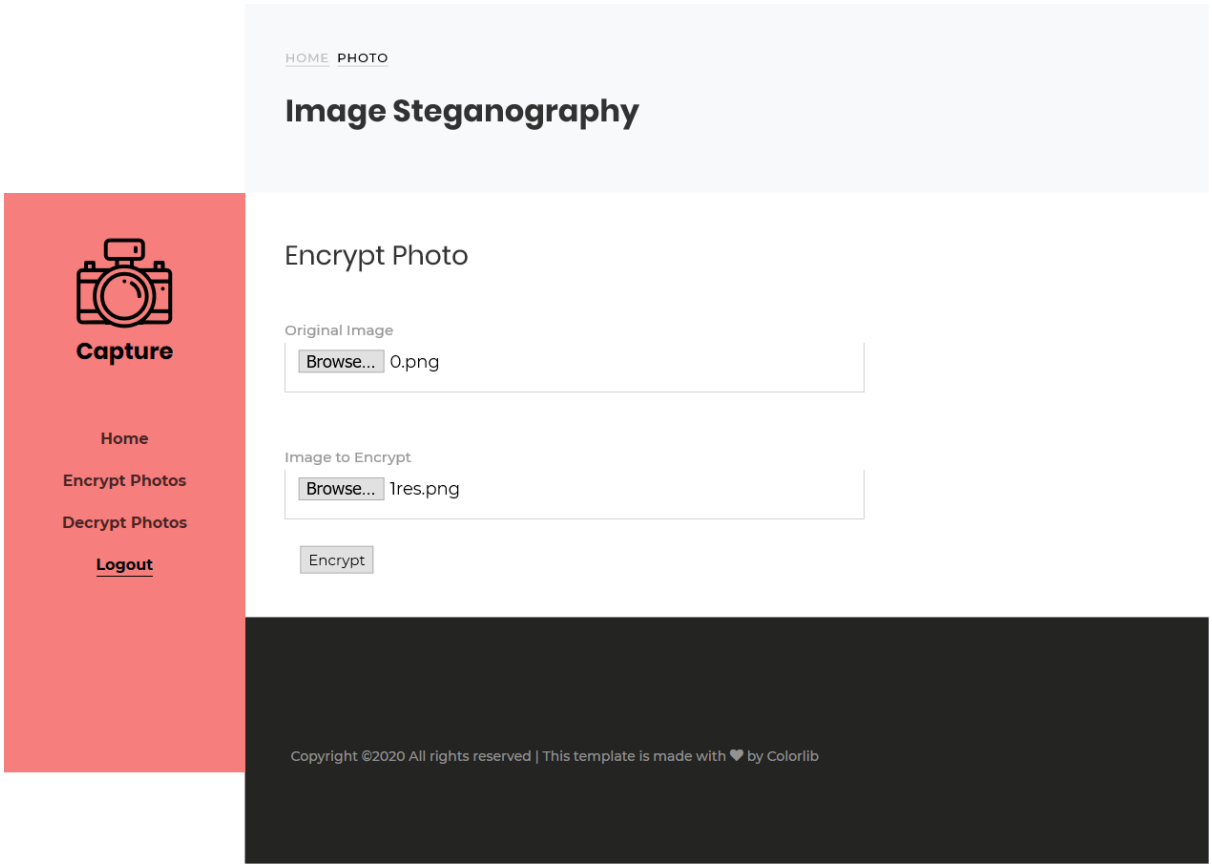
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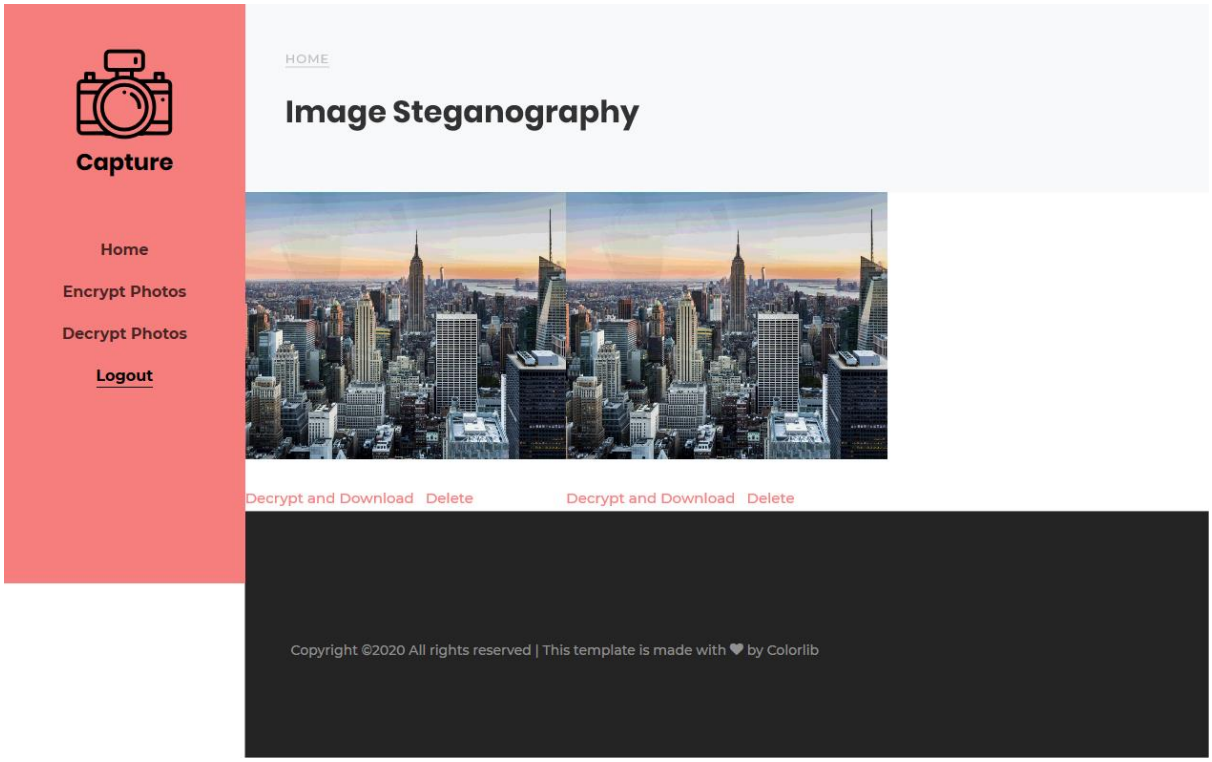
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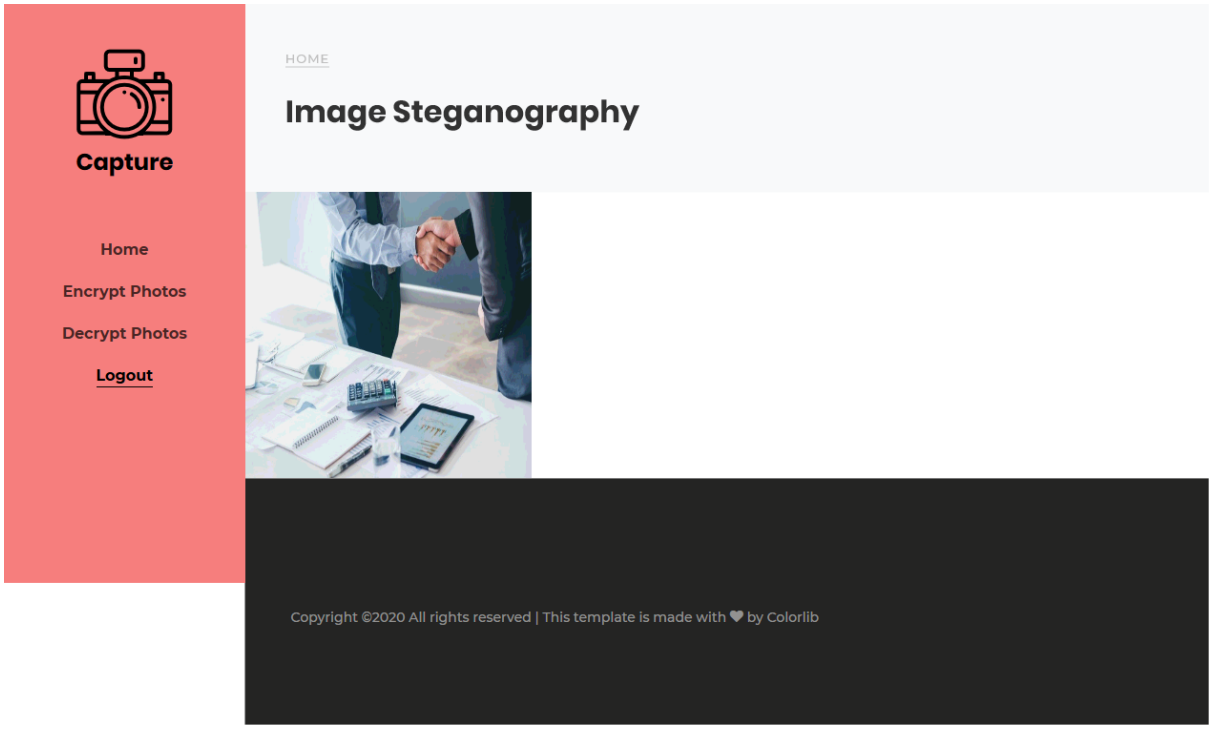
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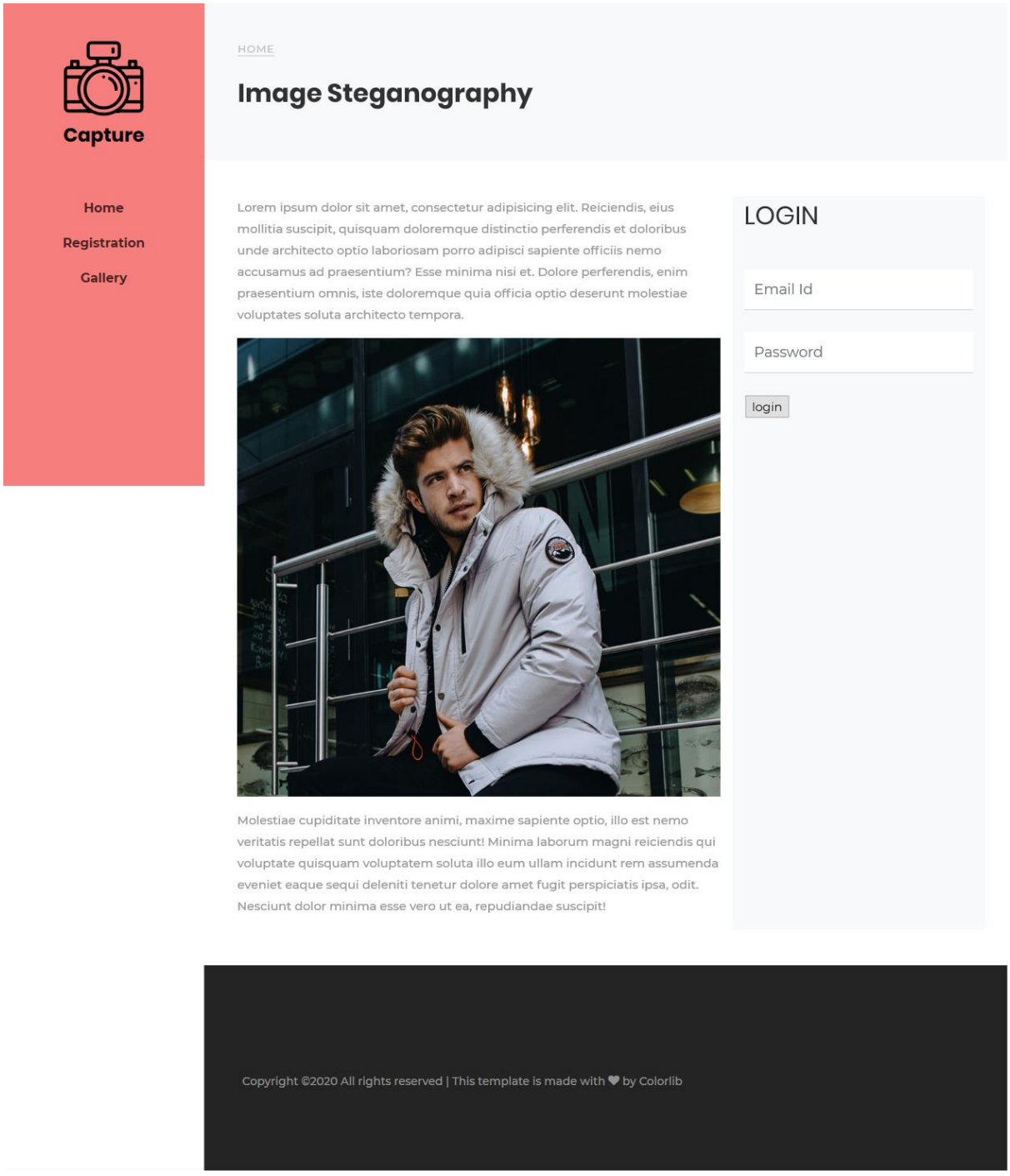
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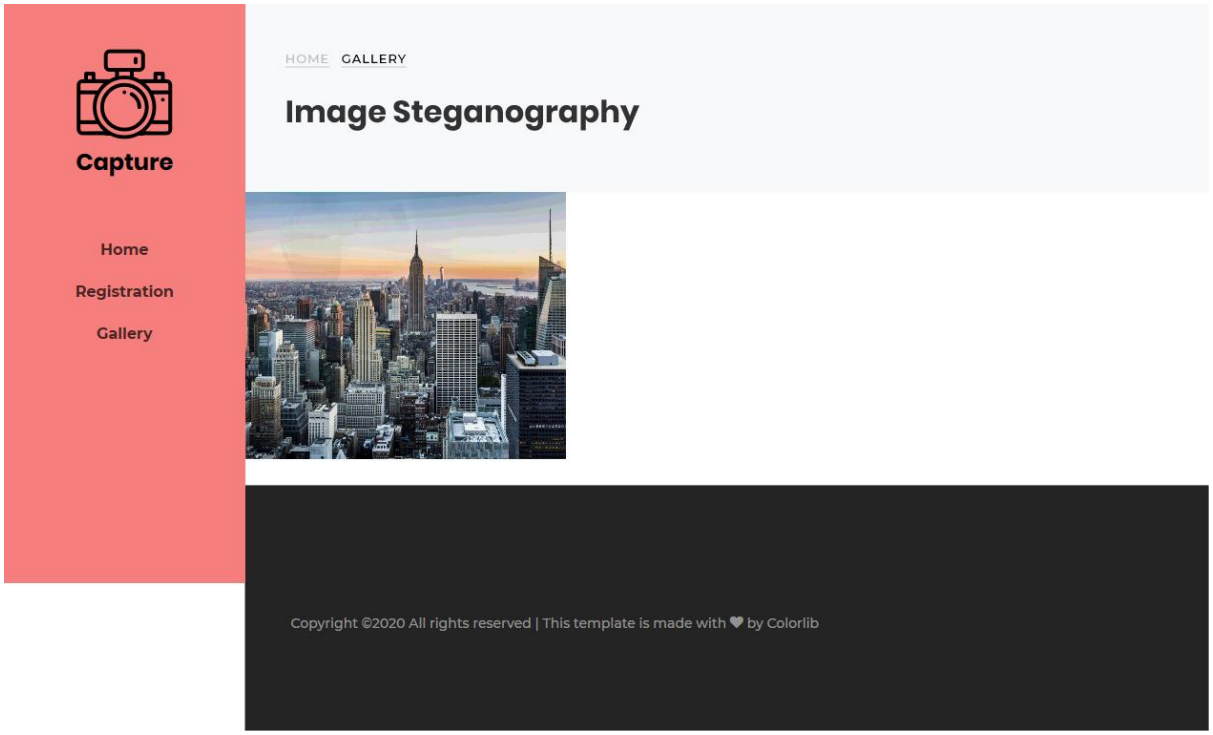
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7. SYSTEM IMPLEMENTATION

One of the important parts of implementation is user training. A normal person can be trained within a week with all aspect of Image steganography software. Another important concern is the site preparation. Site preparation plays little role because the system have only one computer for entire operations.

Image steganography is expected to run more than 8 years. After that time system may become slow due to the huge amount of data storage. In such case software maintenance is necessary. Even if maintenance is not done system will not lose any data or will not produce result with errors. Accuracy is guaranteed.

8. CONCLUSION AND SCOPE FOR FUTURE ENHANCEMENT

It is believed that almost all system objective have been met a trail run of the system has been made and is given good result. The procedure for processing is simple and regular in order.

The system has been developed keeping in view of the limitation of the existing manual system and an attempt has been made to overcome the limitation. It will send faster and better service to the user. System has got the feature of the easy generation of various reports of which are indispensable for efficient management. The new system will almost definitely preferred over the existing system. However the modification can be made depending on the changing environment for maximum utilization of the system users would make sure that all the data entries are made in the time and the entries would be completed.

The enhancements made in the project for future are:

1. More than 1 MB images can be encrypted fast.
2. Can be applied in any social media for uploading images.

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