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## Integral security option towards unpredictable patterns

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### ABSTRACT

*The most predominant computer authentication method is to use alphanumerical usernames and passwords whereas this method has been shown many major disadvantages. This is due to the problem that, users tend to choose passwords that can be easily guessed and hacked by the hackers. On the other hand, Considering the user have got a password which is difficult to guess, then it is difficult to remember. To overcome this kind of problem of low security, High end Authentication methods are developed by researchers that use images as crystal clear password. In our research, we conduct a comprehensive study on the existing graphical password techniques and provide a possible solution using Graphical password schemes which have been proposed as a possible alternative to text-based schemes. This is based on the human intelligence analysis such as, humans can remember pictures better than text; Pictures are generally very easy to be remembered or recognized than text. The high-level concept is, user is permitted to click the portion of an image, each click results in showing a next-image, in effect leading users down a "path" based on the type and portion of click on their sequence of points. A wrong click by the fake user leads down in an incorrect path, with an explicit indication of authentication failure only after the final click. Fake users more than 2 attempts will be blocked from future access.*

**Keywords**— Alphanumerical Usernames, Graphical Password Techniques, Authentication Failure

### 1. INTRODUCTION

#### 1.1 Synopsis

Network Security consists of protocols to stop the misuse and check the unwanted behaviour, modification, or denial of a network-accessible and resources network. Network security involves the authorization of access to data during a network, which is controlled by the network administrator. Users choose or are assigned an ID and password or other authenticating information that permits them access to the data in the given user ID and programs within their authority. Network security have computer networks both in personal and public that is used in chores conducting communications and transactions among businesses, government agencies and individuals. Networks are often private, like within a corporation, et al. which could be hospitable public access. Network security is involved in

organizations, enterprises, and other sorts of institutions. It does as its title explains: It secures the network, also as protecting and overseeing operations being done. The most common and straightforward way of protecting a network resource is by assigning it a singular name and a corresponding password.

#### 1.2 Objective

The thought of captcha to interpret the licensed human is incorporated that prevail the human illusion with the server by crypto logic ideas. Image hotspot technique concomitant with the notion of captcha styles the system in increased approach with security live. An ordered image hotspot has been designed by suggests that of graphical illustration or clued points on the image taken. On the thriving traversal of the five ordered hotspot pictures, the user gets genuine to the server. The ordered traversal of hotspot image will be been known by pattern matching situation so as to correlate the licensed user's click points within the hotspot.

#### 1.3 Scope

To extend the multiple variety of hotspot level to avoid the vulnerability of the system. Conjointly the pattern matching technique wont to distinguishing the approved users supported our entered hotspot level.

### 2. SYSTEM STUDY

#### 2.1 Feasibility Study

The feasibility of the project is analyzed during this phase and business proposal is put forth with a really general plan for the project and a few cost estimates. During system analysis the feasibility study of the proposed system is to be administered. This is to make sure that the proposed system isn't a burden to the corporate. For feasibility analysis, some understanding of the main requirements for the system is important. Three key considerations involved within the feasibility analysis are:

##### 2.1.1 Economical Feasibility

This study is administered to see the economic impact that the system will wear the organization. The amount of fund that the corporate can pour into the research and development of the system is restricted. The expenditures must be justified. Thus, the developed system also within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

### 2.1.2 Technical Feasibility

This study is administered to see the technical feasibility, that is, the technical requirements of the system. Any system developed should not have a highly required technical resources available. This will cause high demands on the available technical resources. This will cause high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this technique.

### 2.1.3 Social Feasibility

The aspect of study is to see the extent of acceptance of the system by the user. This includes the method of coaching the user to use the system efficiently. The user should not be threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to teach the user about the system and to form him conversant in it. His level of confidence must be raised in order that he's also ready to make some constructive criticism, which is welcomed, as he's the ultimate user of the system.

### 2.2 System Analysis

The analysis of the system could even be an integrated process dissecting the system responsibilities that are supports the matter domain features and user requirements.

## 3. EXISTING SYSTEM

- Security plays a major role in the authentication process in high severity applications. Passwords are the type of secret code used in the process of authentication.
- within the existing system, a captcha and picture-based authentication is meant to authenticate into the system.
- The concept of visual cryptography has been integrated with the captcha for individual user and got splatted equally in order to store in the server.
- The Server provide authentication to the requestor thereby verifying the captcha by merging the splatted shares to ensures the authorized human interpretations.
- The authentication by means of picture also been a part of the prevailing methodology that features a feature of picture spot clicking password.

### 3.1 Disadvantages

- The drawback of the existing system is that only a specific number of pictures can be utilized to set as a password and there are no successive cued clicks.
- The vulnerability of cracking the password is high that results in insecurity.

## 4. PROPOSED SYSTEM

- The projected system encompasses severe security outlook to design a secure authentication system.
- The concept of captcha to interpret the authorized human is assimilate that prevail the human speculation with the server by cryptographic concepts.
- Image hotspot methodology accompanying with the notion of captcha designs the system in enhanced way with security and safety measure.
- Successive image hotspots have been designed by means of graphical representation or clued points on the image taken.
- On the thriving traversal of the 5 successive hotspot images, the user gets authenticated to the server.
- The successive traversal of hotspot image are often identified by pattern matching scenario so as to correlate the authorized user's click points within the hotspot.

### 4.1 Advantages

- The Advantages of the proposed system is to increase the multiple number of hotspot level to avoid the vulnerability of the system.
- Also, the pattern matching technique used to identifying the authorized users based on our entered hotspot level.

## 5. SYSTEM DESIGN

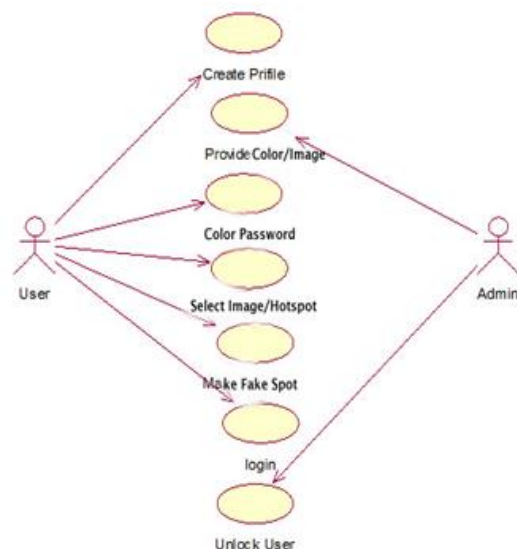
System Design involves identification of classes their relationship also as their collaboration. In objector, classes are carve up into entity classes and control classes. The Computer Aided Software Engineering (CASE) tools that are available commercially don't provide any assistance during this transition. CASE tools cash in of Meta modelling that are helpful only after the development of the category diagram. In the FUSION method few object-oriented perspectives likes Object Modelling Technique (OMT), Classes, and Responsibilities. Collaborators (CRC), etc., are used. Objector used the term" agents" to represent a number of the hardware and software. In Fusion method, there is no necessity phase, where a user will furnish the initial requirement document. Any software project is figured out by both the analyst and therefore the designer. The analyst creates the user case diagram. The designer creates the class diagram. But the designer can do that only after the analyst creates the utilization case diagram. Once the planning is over, it's essential to make a decision which software is suitable for the appliance

### 5.1 UML diagram of the project

UML is a standard language for specifying, visualizing, and documenting of software systems and created by Object Management Group (OMG) in 1997. There are three important type of UML modelling are Structural model, Behavioral model, and Architecture model. To model a system the foremost important aspect is to capture the dynamic behavior which has some internal or external factors for creating the interaction. These internal or external agents are known as actors. It consists of actors, use cases and their relationships. In this fig we represent the utilization Case diagram for our project.

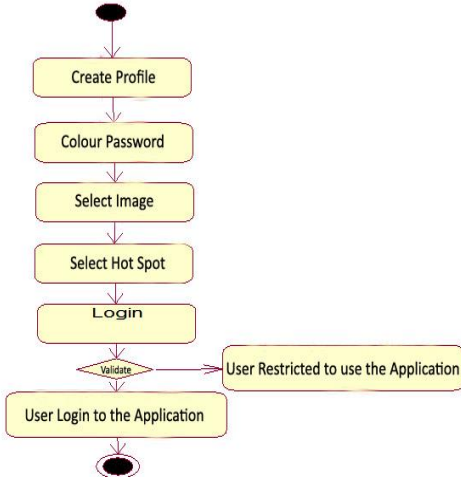
### Use case Diagram

A use case may be a set of scenarios that describing an interaction between a user and a system. A use case diagram displays the connection among actors and use cases. The two main components a user or another system that will interact with the system modelled. A use case is an external view of the system that represents some action the user might perform so as to finish a task.



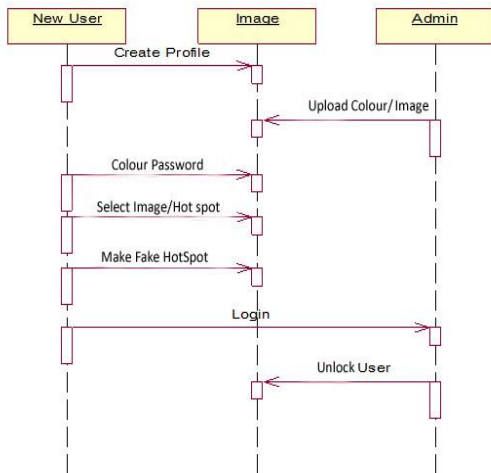
### 5.2 Activity Diagram

Activity diagram are used customarily for business process design for modelling the logic encapsulate by one use case or usage plot, or for modelling the complete logic of a business strategies. Although UML activity diagrams could potentially model the interior logic of a posh operation it might be much better to easily rewrite the operation in order that it's simple enough that you don't requires an activity diagram. In some ways UML activity diagrams are the object-oriented equivalent of flow charts and data flow diagrams (DFDs) from structured



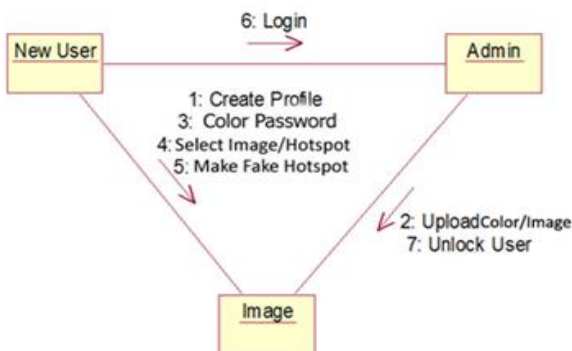
### 5.3 Sequence Diagram

The Sequence Diagram models the collaboration of objects supported a time sequence. It shows how the objects interact with others during a particular scenario of a use case.

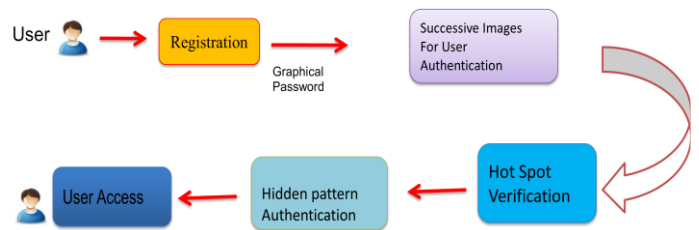


### 5.4 Collaborations Diagram

A diagram collaboration narrates connections between objects in terms of succession messages. Collaboration diagrams indicate a mixture of data taken from class, sequence, and use case diagrams describing both the static structure and dynamic behavior of a system.



### 5.5 Data Flow Diagram

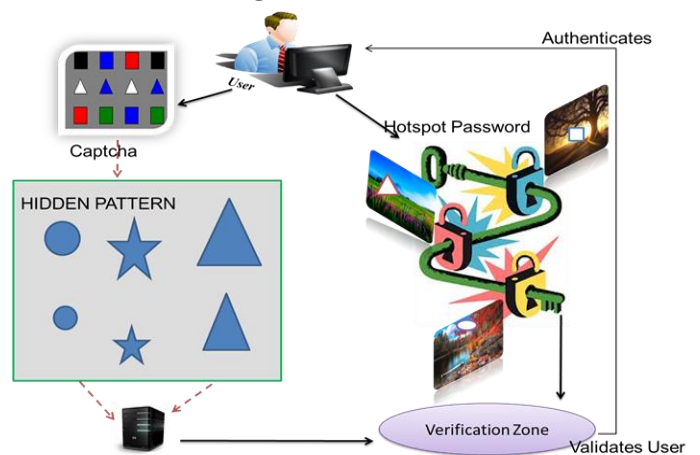


The Data flow chart may be a graphic tool used for expressing system requirements during a graphical form. The DFD also mentioned because the "bubble chart" has the aim of clarifying system requirements and identifying major transformations that to become program in system design.

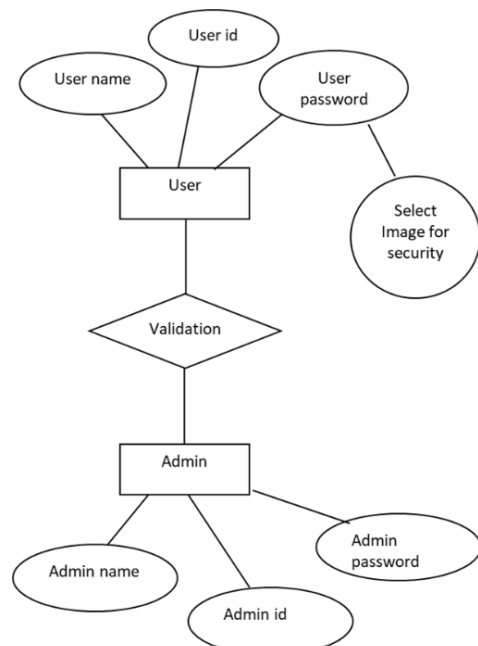
Thus, DFD are often stated because the start line of the planning phase that functionally decomposes the wants specifications right down to rock bottom level of detail.

The DFD contains series of bubbles joined by lines. The bubbles represent data transformations and therefore the lines represent data flows within the system. A DFD describes what that data flow in instead of how they're processed. So, it doesn't depend upon hardware, software, arrangement or file organization.

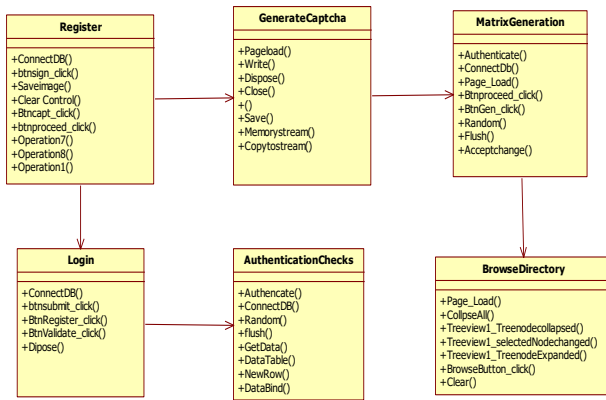
### 5.6 Architectural Diagram



### 5.7 Entity Relationship Diagram



## 5.8 Class Diagram



## 6. SYSTEM TESTING

### 6.1 Testing Objectives

The purpose of testing is to discover errors. Testing is that the process of trying to get every conceivable fault or weakness during a work product. It provides the thanks to see the functionality of components, sub-assemblies, assemblies and/or a finished product it's the tactic of exercising software with the intent of ensuring that the software meets its requirements and user expectations and doesn't fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

### 6.2 Types of tests

**6.2.1 Unit testing:** Unit testing involves the planning of test cases that validate that the interior program logic is functioning properly, which program inputs produce valid outputs. All decision branches and internal code flow must be up hold. It is the testing of individual software units of the appliance .it is done after the completion of a private unit before integration. This is a structural test that relies on knowledge of its architecture and is invasive. Unit tests perform basic tests at component level and test a selected business process, application, and/or system configuration. Unit tests validate that every unique path of a business process performs accurately to the documented stipulations and contains clearly defined inputs and expected results.

**6.2.2 Integration testing:** Integration tests are designed to check integrated software components to work out if they really run together program. Testing is event driven and is more concerned with the essential outcome of screens or fields. Integration tests indicate that although the constituents were individually gratification, as shown by successfully unit testing, the mixture of components is correct and consistent. Integration testing is specifically aimed toward exposing the issues that arise from the mixture of components.

**6.2.3 Functional test:** Functional tests furnish organized affirmation that functions tested are available as described by the business and technical requirements, system documentation, and user manuals. Functional testing is centered on the following items:

- Valid Input recognized classes of valid input must be received.
- Invalid Inputs are identified classes of invalid input should be rejected.
- Functions identified functions must be exercised.
- Outputs are identified classes of application outputs should be exercised.
- Systems Procedures interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is concentrated on requirements, key functions, or special test cases. In addition, organized coverage concerning recognize Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and therefore the effective value of current tests is decided.

### Test objectives

- All field entries must work properly.
- Pages should be activated from the identified link.
- The entry screen, messages and responses should not be delayed.

### Features to be tested

- Verify that the entries are of the right format
- No duplicate entries should be allowed
- All links should take the user to the right page.

### 6.3 System Test

System testing ensures that the whole integrated software meets requirements. It tests a configuration to make sure known and predictable results. An example of system testing is that the configuration-oriented system integration test. System testing is predicated on process descriptions and flows, emphasizing pre-driven process links and integration points.

### White Box Testing

White Box Testing may be a testing during which during which the software tester has knowledge of the inner workings, structure and language of the software, or a minimum of its purpose. It is purpose. It is wont to test areas that can't be reached from a recorder level.

### Black Box Testing

Black Box Testing is testing the software with none knowledge of the inner workings, structure or language of the module being tested. Black box tests and other sorts of tests, should be written from a definitive source document, like specification or requirements document. It is a testing during which the software under test is treated, as a recorder. you cannot "see" into it. The test provides the inputs and give responds to outputs without considering how the software works.

### Unit Testing

Unit testing is typically conducted as a part of a combined code and unit test phase of the software lifecycle, although it's not uncommon for coding and unit testing to be conducted as two distinct phases.

### 6.4 Test strategy and approach

Field testing are going to be performed manually and functional tests are going to be written intimately.

### Test objectives

- All field entries must work properly.
- Pages should be activated from the identified link.
- The entry screen, messages & responses should not be delayed.

### Features to be tested

- Verify that the entries are in correct format
- No duplicate entries should be allowed
- All links must be taken user to the user correct page.

### Integration Testing

Software integration testing is the incremental testing of two or more integrated software components on one platform to supply failures caused by defects in the interface.

The task of the mixing test is to see that components or software applications, e.g. components during a software or- one intensifies software applications at the corporate level, interact without error.

### **Test Results**

All the test cases mentioned above passed successfully. No defects encountered.

### **Acceptance Testing**

User Acceptance Testing may be a critical phase of any project and requires significant participation by the top user. It also ensures that the system should meet the functional requirements.

## **7. CONCLUSION**

### **7.1 Summary**

We have generated CAPTCHA is splinted into 2 by the thought of visual cryptography within the server for authentication functions and merged to verify the credibleness. Within the planned methodology, a Graphical Image secret has been designed that gives the users with associate degree choice to choose the hotspots within the hierarchy of the photographs. The sequential choice of the precise hot spots within the splinted image can modify the user to maneuver to subsequent thriving pictures. These hotspots are the approach differently in a different way in our own way otherwise outstanding way of authentication.

### **7.2 Future Enhancement**

In this project we are going to secured way authentication in web security vulnerabilities and identifying the attacks from hackers. It could be a valuable process to securing our website. In future it can be able to handle in a secured alteration while hot spot generates the fake clued click point to make more secured it can send alert messages to mobile phones and in email which has been blocked IP address and mac address as a text. so, the user can identify the intruders.

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