

A Project for Software Engineering Lab

AUTI_Q

A project submitted to the Department of Computer Science and Engineering in partial fulfillment CSEL-3206-Software Engineering Lab course for the Degree of B.Sc. in Computer Science and Engineering.



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Recommendation of the Board of Examiners

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Declaration of Authorship

This is to certify that the work presented in this project is carried out by the candidates - MD. Rashedul Alam and Nilay Biswas under the supervision of Dr. Md. Ashraf Uddin in the Department of Computer Science and Engineering, Jagannath University, Dhaka - 1100, Bangladesh. It is also declared that neither of this project nor any part of this project has been submitted anywhere else for any degree of diploma. Information derived from the published and unpublished work of others has been acknowledged in the text and a list of references is given.

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Abstract

Undoubtedly, one of the most frequently studied conditions in the field of mental health today is the autism spectrum disorders (ASD). One of the most controversial topics with respect to this population is the prevalence of this spectrum of disorders. The number of cases has risen dramatically, and various hypotheses have been put forward to explain this phenomenon. Among the most frequently addressed possibilities are expanded diagnostic criteria, more awareness of the disorder, diagnosis at earlier ages, and the recognition that ASD is a lifelong condition. The term autism spectrum disorders (ASD) has been used to describe their variable presentation. Although the cause of these disorders is not yet known, studies strongly suggest a genetic basis with a complex mode of inheritance. More research is needed to explore environmental factors that could be contributing to the cause of these disorders. The occurrence of ASD has been increasing worldwide, with the most recent prevalence studies indicating that they are present in 6 per 1000 children. The objectives of this Project are to provide the kids with ASD relevant things that needed to make them manpower so that no one can't think about them that burden of society.

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Chapter 1

Introduction

1.1 Introduction

Autism is one of a group of neurodevelopmental disorders known as pervasive developmental disorders (PDD). These disorders are characterized by three core deficits: impaired communication, impaired reciprocal social interaction and restricted, repetitive and stereotyped patterns of behaviors or interests. The presentation of these impairments is variable in range and severity and often changes with the acquisition of other developmental skills.

In 1943, the American psychiatrist Leo Kanner used the term “early infantile autism” to describe children who lacked interest in other people.¹ In 1944, an Austrian pediatrician, Hans Asperger, independently described another group of children with similar behaviors, but with milder severity and higher intellectual abilities. Since then, his name has become attached to a higher functioning form of autism, Asperger syndrome.² It was not until the 1980s that the term pervasive developmental disorders was first used.

The definition and diagnosis of these disorders has been broadened over the years to include milder forms of autism. The term autism spectrum disorders (ASDs) is currently used to describe three of the five pervasive developmental disorders listed in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and the International Classification of Diseases, Tenth Edition (ICD-10): autistic disorder, Asperger disorder and pervasive developmental disorder-not otherwise specified (PDD-NOS),

- Autistic Disorder
- Asperger disorder
- Rett disorder
- Childhood disintegrative disorder
- Pervasive developmental disorder- not otherwise specified (PDD-NOS)

1.2 Problem Statement: The children who show symptoms of ASD, shows limited and repetitive patterns of behavior. The children with the symptoms of this disorder have IQ levels near 0.

1.3 Motivation: We can't think of our nation's prosperity keeping a part of our people put away. We've to make them or improve them to manpower, not burden our society. "If they can't learn in our way, we'll teach them in their way."

1.4 Objectives: In our project we should build an application and via this app we will teach them the basic things so that their IQ level should be increased. We will use ML and AI tools here if needed in future.

Chapter 2

Literature Overview

2.1

A diagnosis of autistic disorder is made when there are impairments in communication and reciprocal social interaction with the presence of restricted repetitive and stereotyped patterns of behaviors or interests, prior to the age of 3 years. When autistic symptoms are present with no significant general delay in language and cognitive development, a diagnosis of Asperger disorder is made. A diagnosis of PDD-NOS is given when the triad of symptoms is present but the criteria are not met for a specific PDD.³ Often the label "high-functioning autism" is used interchangeably with Asperger disorder.⁵ This is controversial and there is considerable debate as to whether children with Asperger disorder, who have normal language milestones, should be considered to comprise a subgroup distinct from high-functioning children with autism, who have a history of delayed language development.

2.1.2 Epidemiology

ASD occurs more often in boys than girls, with a 4:1 male-to-female ratio.⁷ The reported prevalence rates of autism and its related disorders have been increasing worldwide over the past decades, from approximately 4 per 10 000 to 6 per 1000 children.^{8–12}

2.1.3 Etiology

The exact cause of autism and the other ASDs is still not known. The etiologic theories have changed over the years. It was once thought to be the result of faulty child-rearing. This historical psychosocial theory has been rejected, as research clearly indicates that the etiology is multi-factorial with a strong genetic basis.

2.1.4 Genetic factors

Family studies have demonstrated that autism is both familial and heritable. The recurrence rate in siblings of an autistic child is 2% to 8%, which is higher than that of the general population.^{8,17} Furthermore, twin studies showed that monozygotic twins have a higher concordance rate than dizygotic twins—90% and 10%, respectively.

2.1.5 Environmental factors

Various environmental factors have been explored as possible causative agents in autism. Epidemiological studies indicate that some environmental factors, including prenatal infections with rubella and cytomegalovirus, account for few cases of autism.¹⁷ The role of heavy metals in the etiology of autism is controversial and requires more research.

2.1.6 Measles, mumps and rubella vaccine and the ASD hypothesis

An article published in 1998 suggested a possible relationship between the MMR vaccine and ASD. Since then, there has been a decline in the rate of MMR vaccination among children. As a consequence of that, there have been measles outbreaks. These factors led to the conduction of large worldwide studies to examine this potential relationship. These studies showed that there is no association between MMR vaccine and ASDs.

2.1.7 Diagnosis

Physicians play an important role in early recognition of ASD, because they are usually the first point of contact for parents. Therefore, it is important that physicians be able to recognize the various signs and symptoms of this group of disorders.³⁵ Physicians should be alerted to the possibility of autism and its related disorders when there are qualitative impairments in social, language and communication skills, as well as repetitive interests and behaviors. The severity of these impairments varies significantly among children with ASD. Even though the typical age of onset is before 3 years, the impairments can be subtle and may not be detected before school age. An example of this are children with Asperger disorder, who may be identified and diagnosed much later than children with typical

autism, on average at 11 years of age.⁵ This is because parents of children with Asperger disorder may not recognize the subtle abnormalities in their child's behavior, because they may not have an opportunity to compare them to peers. Conversely, physicians and teachers compare a child's behavior to typically developing children and notice abnormalities and impairments more easily.⁵ This reflects the importance of gathering information about the child from multiple sources, especially when diagnosing the broader pervasive developmental disorders.

The diagnosis is challenging in children at both ends of the spectrum. Children with severe autistic symptoms may be hard to differentiate from those with isolated severe intellectual disability, while those with mild symptoms may be misdiagnosed as having a language disorder or a social anxiety disorder.

2.2 Features

2.2.1 Overview of the System:

In this section, we will describe the features and use cases of our project "Auti_Q".

2.2.2 Features:

After a user login to the system he has his own dashboard. He can go to the learning section and after that he could attempt quizzes. In the learning section we'd added a video from where users can also learn. There would be flash card types for learning. After that one can attempt quizzes and the system will give them scores.

2.2.3 Users and their roles:

There will be two types of users in the system with different responsibilities and restrictions. They are:

- **Anonymous user:** All the users, without having an account or not logging in, will be treated as anonymous users. An anonymous user can only see the home page, about us contact page and the introductory video(will be added by us at the time of the developing phase of our project).
- **Registered user:** Users, those who are registered in the system to get facilities of our project are our registered users. They have access to all other pages of our project.

Use case of the system:

2.2.4 ◆ Registration: An anonymous user and the system are the actors of the use case. There are three types of accounts available for creation.

- -> Registered User
- -> Super user or Admin

2.2.5 ◆ User Page: After login user will go to user dashboard from there user can go to learning section or Quiz section

2.2.6 ♦ Learning Page: Here users can learn about color, fruits, flowers, vehicles and other basic things a person needs.

2.2.7 ♦ Puzzles: Here users can solve given puzzles.

2.2.8 ♦ Quiz: Here one can attempt a quiz after the learning session.

2.3 Hardware Requirements

- Processor : Pentium 2.66 GHz.
- Hard Disk : 512GB.
- Ram : 2 GB.

2.4 Software Specification

- Operating System : Windows 7,8,10, Linux
- Coding Language : PHP, Laravel, JavaScript, jQuery, Bootstrap
- Backend : MySQL
- Server : Xampp
- Browsers : Microsoft Edge, Firefox, Google Chrome.

2.5 System Requirements Analysis

The most important goal of the application as mentioned above is to maintain all the LAUTI_Q procedures in an efficient way. I have carefully worked on understanding what things exactly need and how to make it convenient so that it will not be harmful for them.

Chapter 3

System Design

3.1 Project Approach

The goal of our project is to increase the IQ level and to determine the fields of their interest. As our users are special children, they can't log in or sign up. In that case their guardian will login for their child and their children will do the dew or their parents or guardians will help them operate it. Also their guardians can determine their children's Improvement.

3.2 Architectural Design

Software requirements should be translated into an architecture that describes the top-level structure of the software and identifies its components. This is done by architectural design (also known as system design), which serves as the initial 'blue green' from which software can be built. This framework is designed to examine the software requirements document and design a model to provide implementation reports. These statements are used to define system components including their inputs, outputs, functions and interactions between them. IEEE defines architecture design as 'the process of defining a collection of hardware and software components and their interfaces to set up a framework for developing a computer system.'

Architectural design is a very important time, reliability, cost and performance-related requirement for software engineering. This task is difficult because software engineering paradigms are shifting from single-layer, monolithic, built-to-scratch systems to compositional, mandatory, standards-based, and product line-based systems. Also, the challenge for designers is to accurately understand how to move from architecture design to requirements, to avoid these problems, designers adopt reuse, composition, platform-based, standards-based, and more techniques.

However, architectural design involves the responsibilities of others such as developers, user representatives, systems engineers, hardware engineers, and operations staff. When reviewing the architectural design to minimize risk and error, these stakeholders must be consulted.^[3]

3.3 UML Diagram

UML stands for Unified Modeling Language. One way to visualize a software program is by using a collection of UML diagrams. Today, UML is recognized as the standard of modeling software development by Object Management Group (OMG). This idea has been derived from the use of Gradia Bouch, James Rumba, Evar Jacobson, and the Rational Software Corporation for Object-based Design, but it is widely involved in a variety of software engineering projects.

Study and usage of any Design phase CASE tool

CASE Tool: creatively

Diagrams I used in my projects UML

1. Use Case Diagram
2. Class Diagram
3. Statechart Diagram
4. Component Diagram
5. Deployment Diagram
6. Composite Structure Diagram
7. Object Diagrams
8. Package Diagrams
9. Activity Diagrams
10. Profile Diagrams

2. Performing the Design by using any Design phase CASE tools CASE Tool: Creately

How to use creately:

After going to the page of creately, we've to create a free account and then login to it. We can pick a model or blank sheet to draw our uml diagrams.

Use_Case Diagram:

The AUTI_Q use cases are:

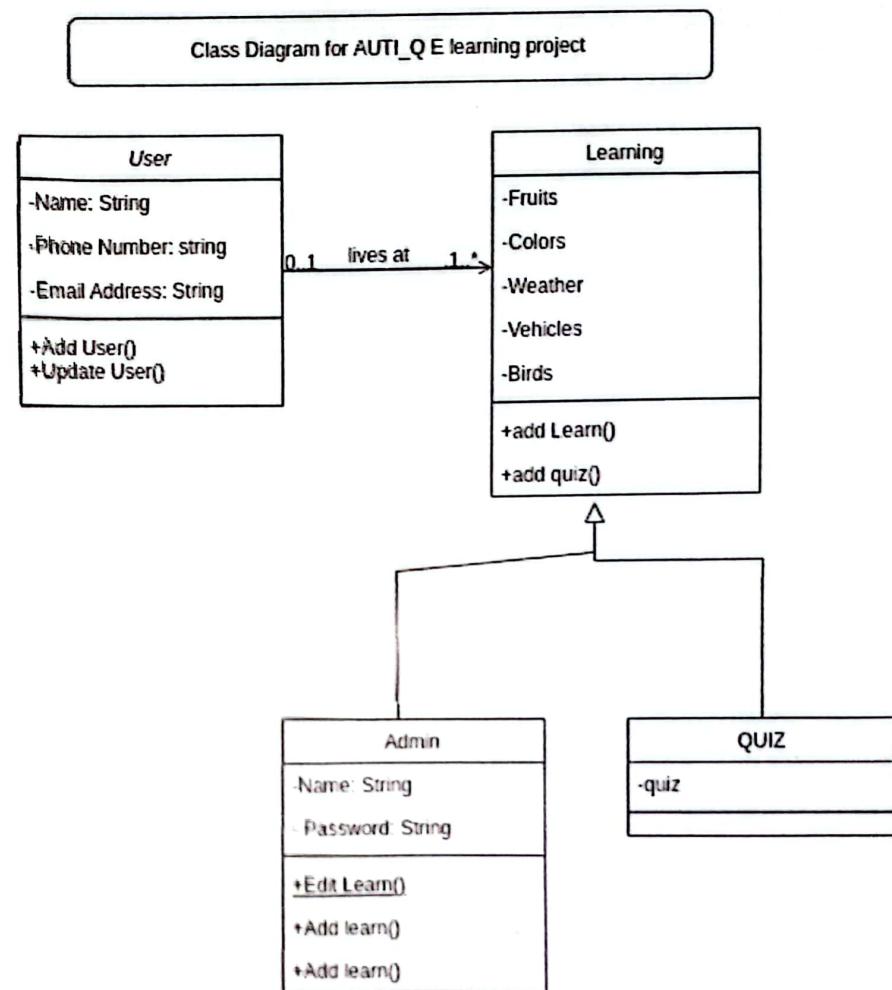
1. reg_user
2. learn_things
3. mini_games
4. **Puzzles**
5. **IQ_test**

Actors Involved:

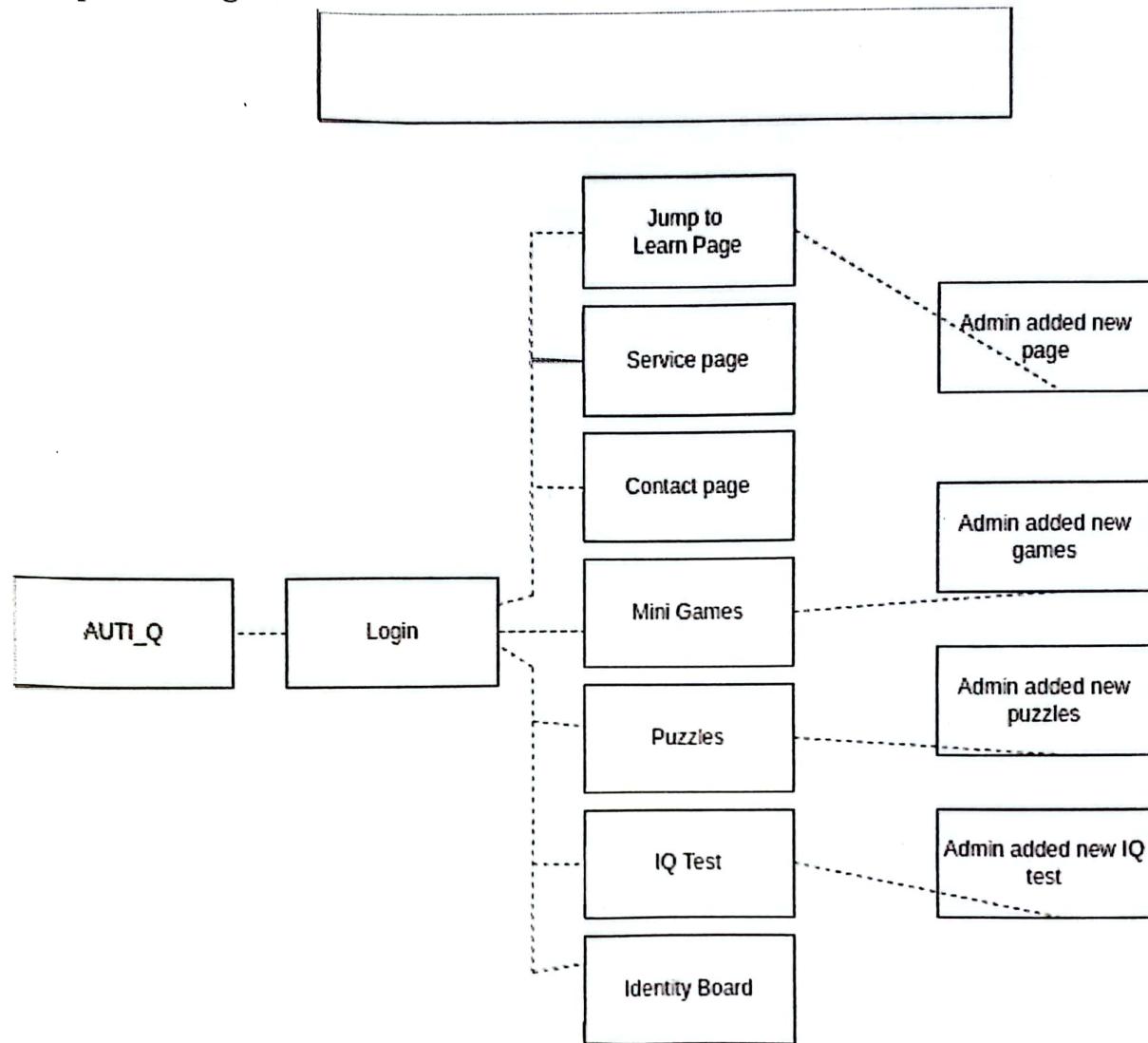
1. Unregistered User
2. Registered User
3. Admin

Class Diagram

ss

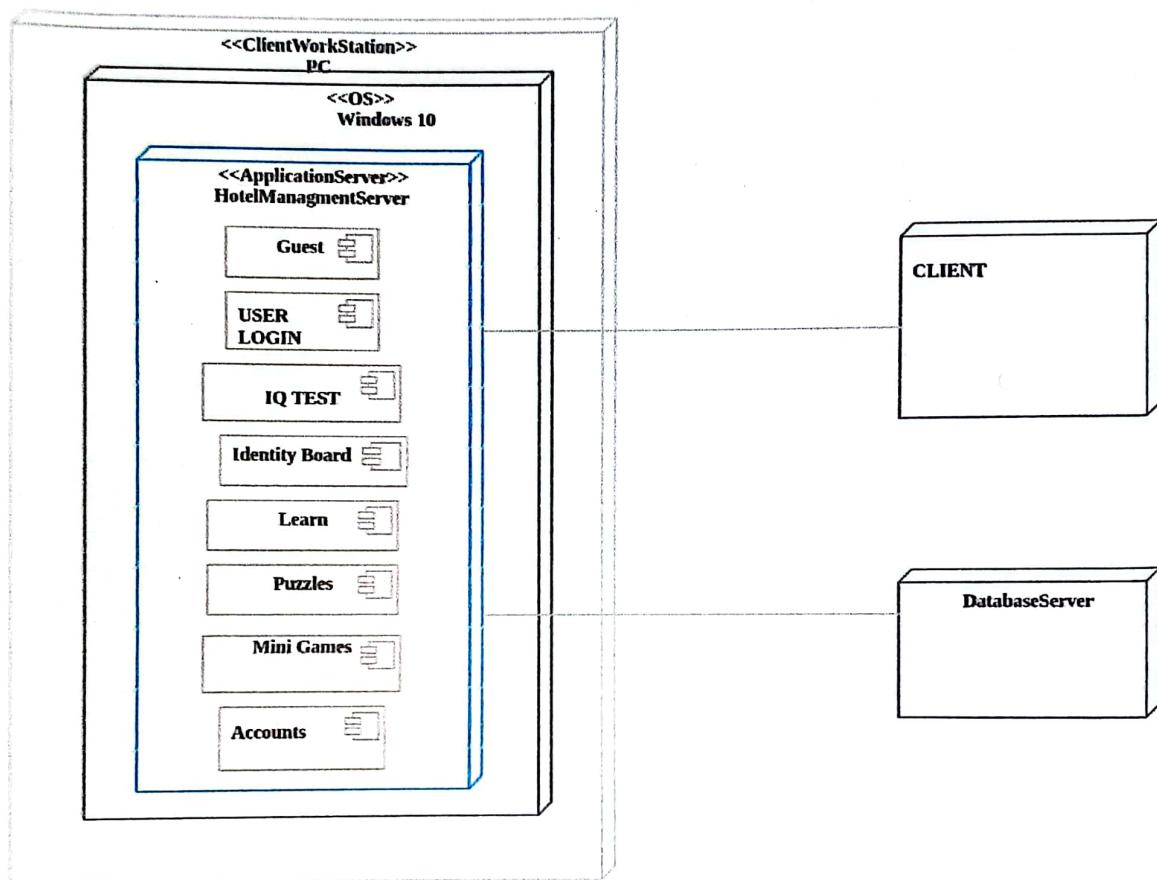


Component Diagram

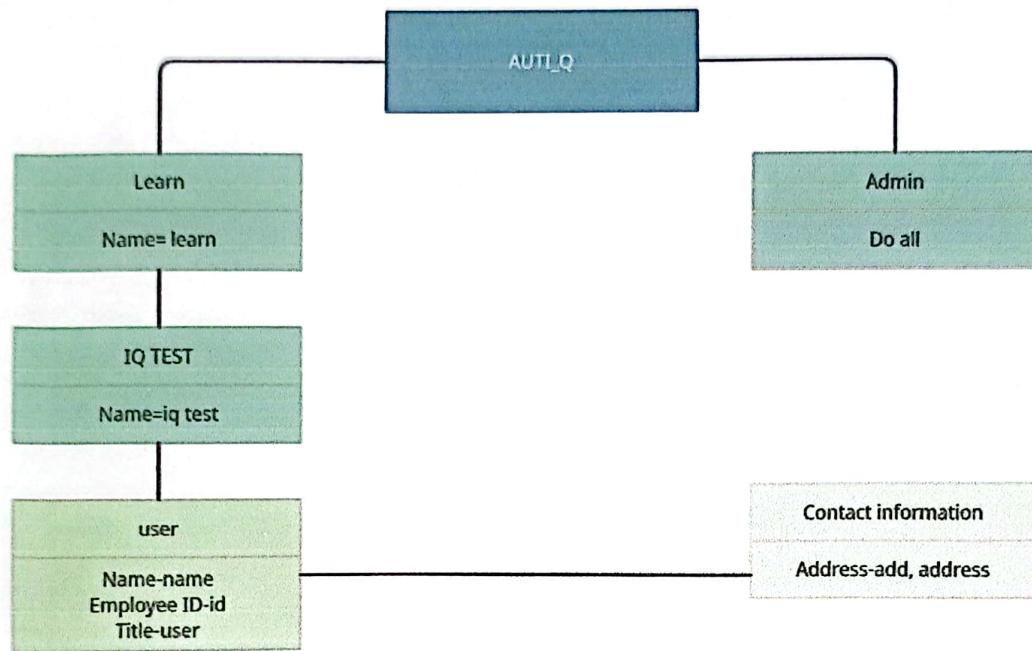


Deployment Diagram

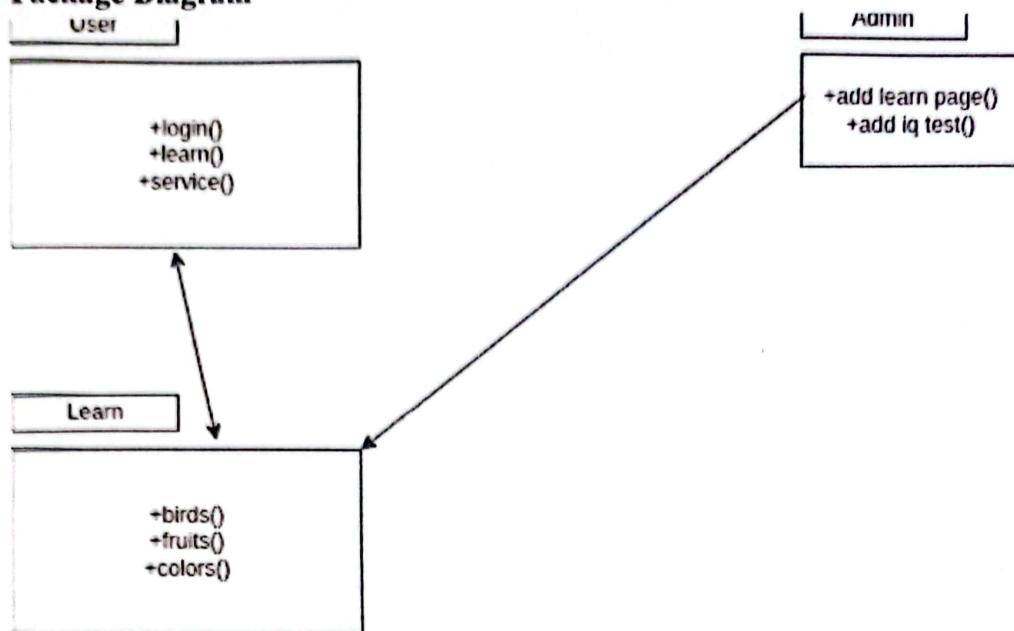
AUTI_Q (E-learning for ASD Child)



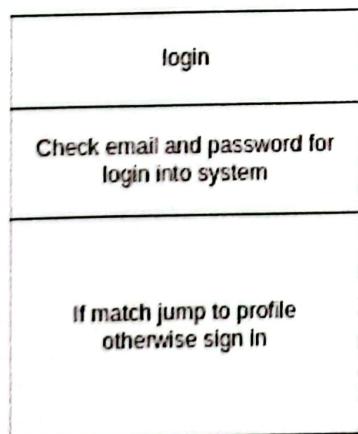
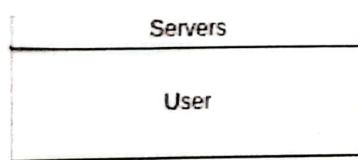
Object Diagram



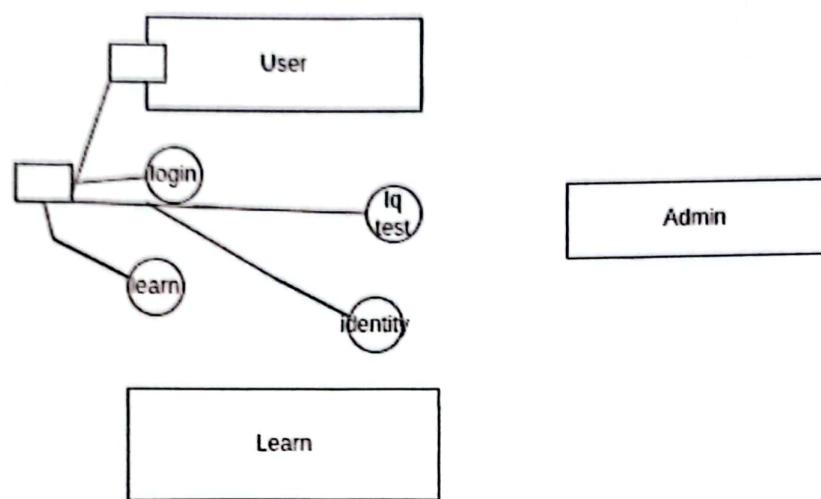
Package Diagram



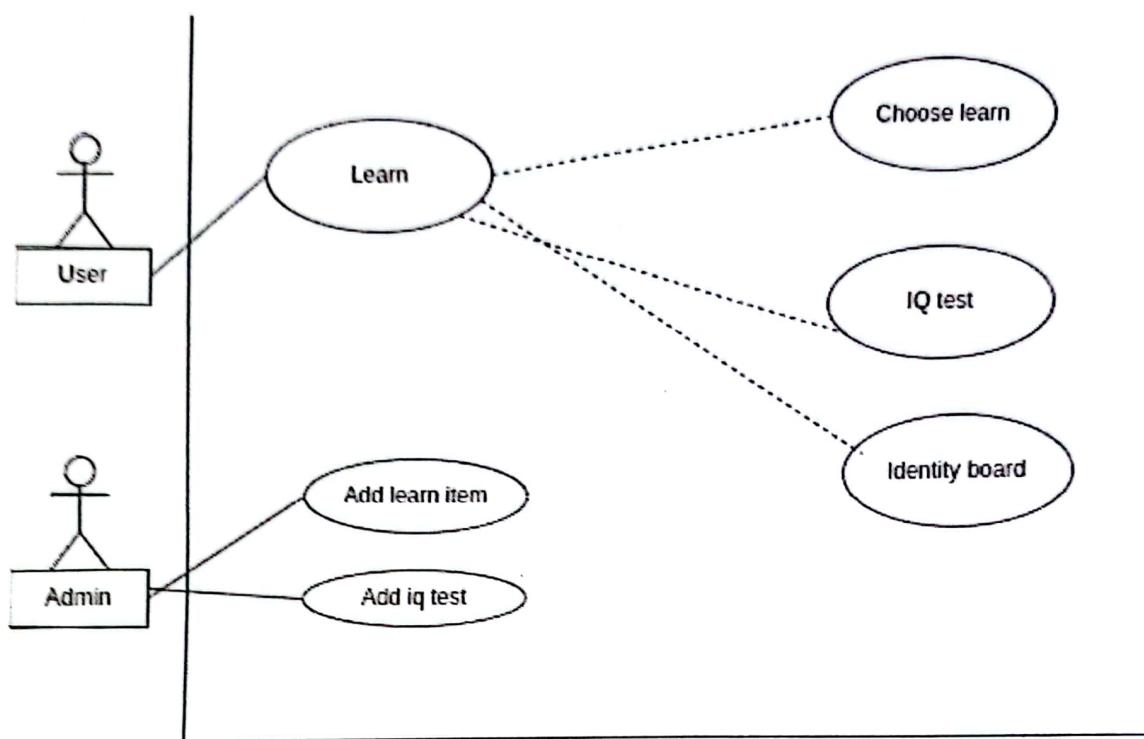
Profile Diagram



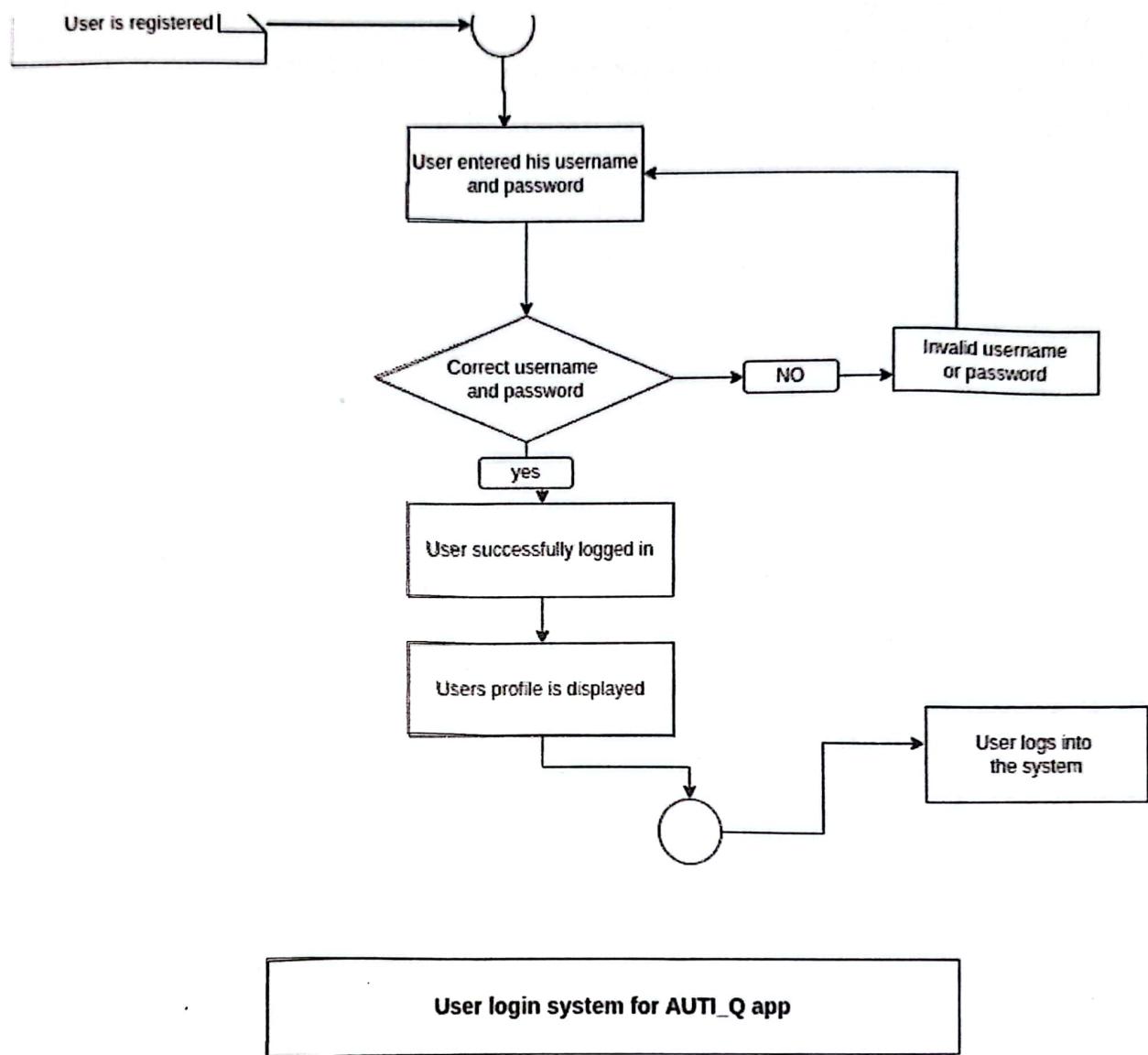
Composite Structure Diagram



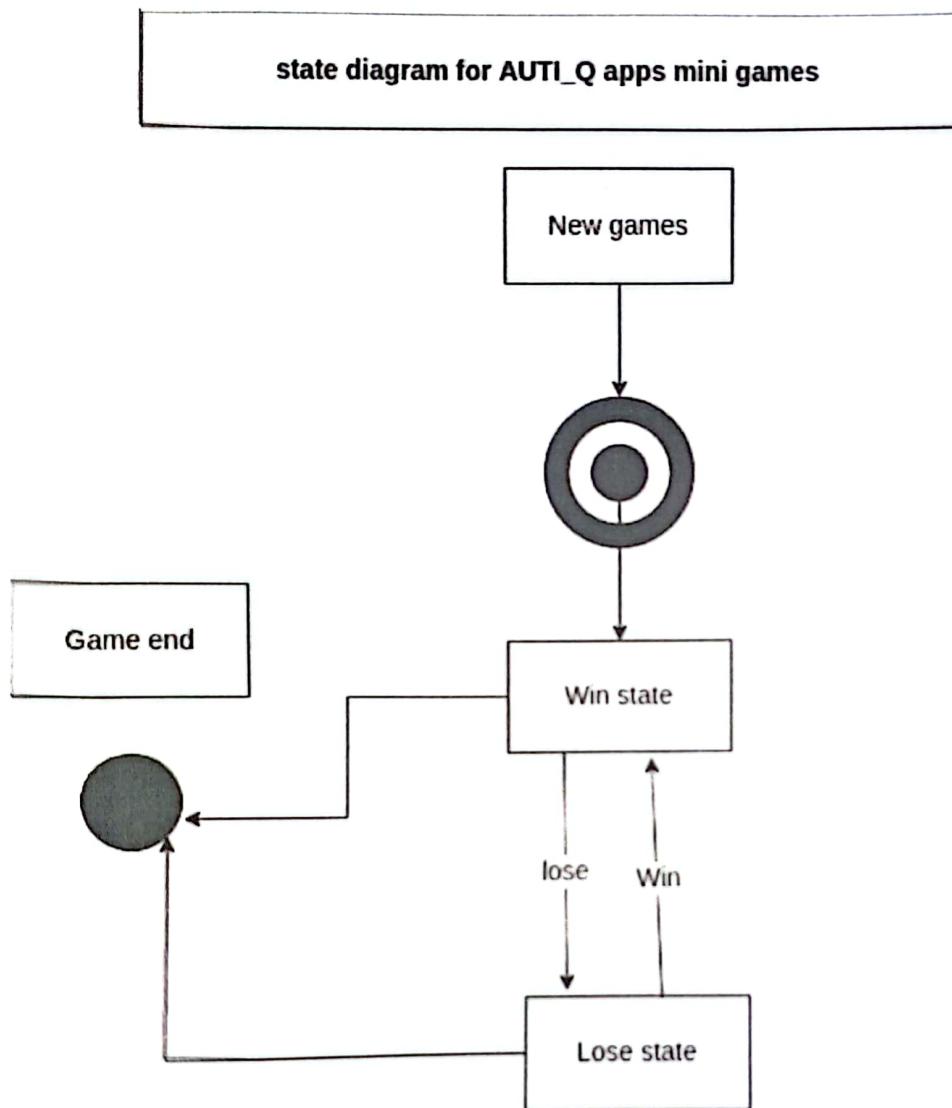
Use Case Diagram



Activity Diagram



State Machine Diagram



Chapter 4

System Implementation

4.1 Home Page: This page will be visible to all the users. Whether the user logged in into it or not. From the Home page the unauthorized user can log in or if he hadn't register yet can register now.

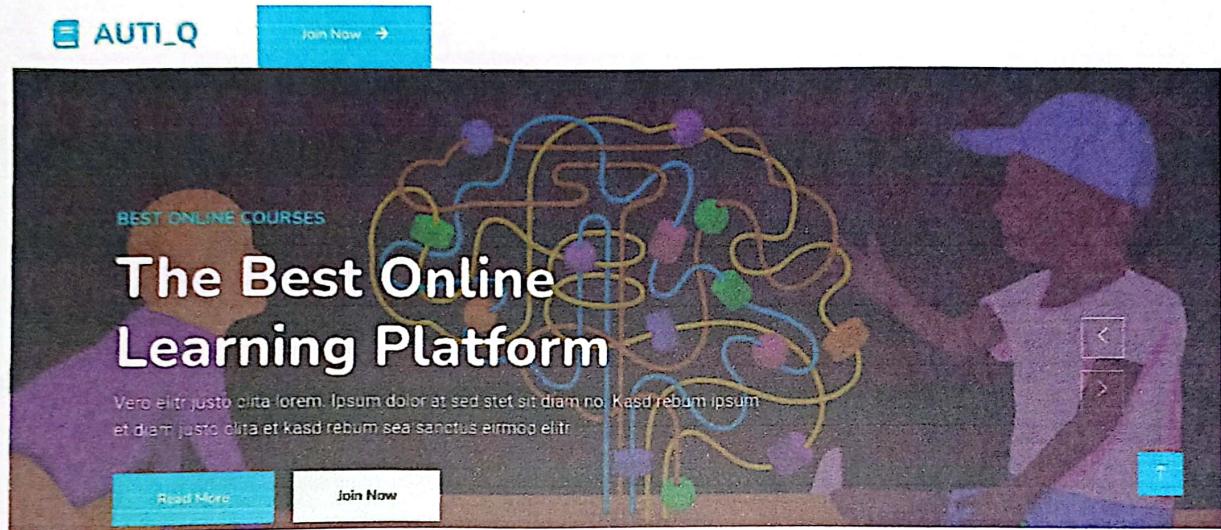
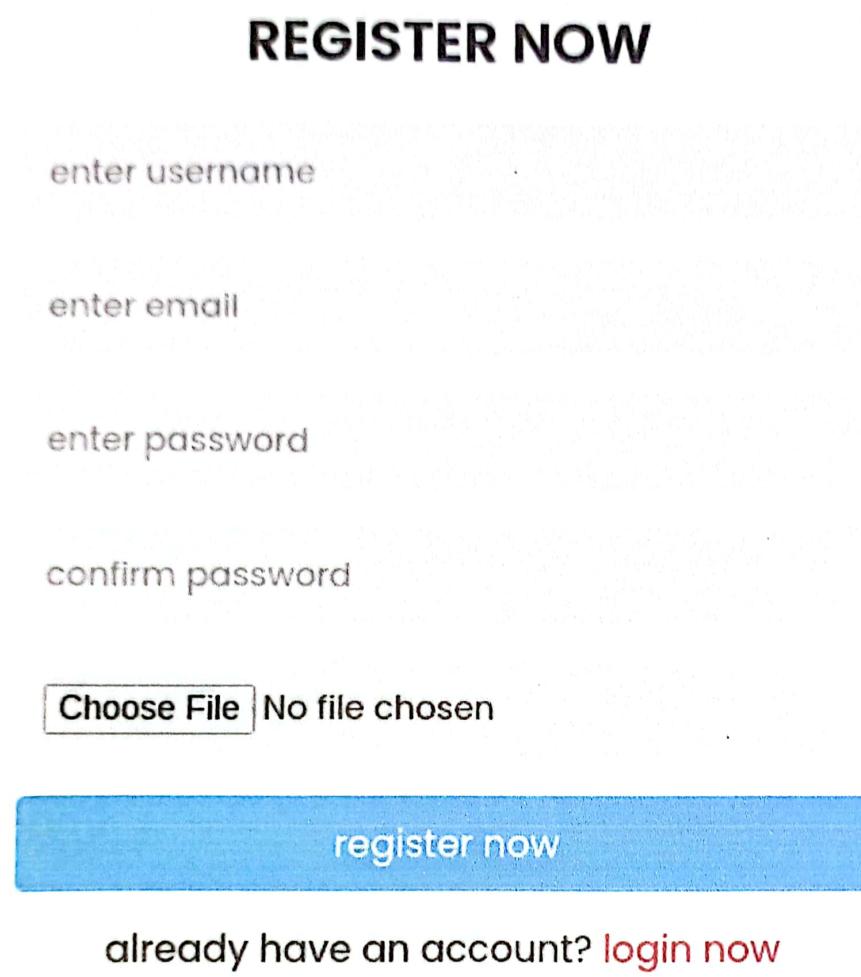


Fig: Homepage of AUTI_Q that everyone can access

4.2 Login

By clicking the join now button A user can move to the login or register page



The screenshot shows a registration form titled "REGISTER NOW". It includes fields for "enter username", "enter email", "enter password", and "confirm password". There is also a file upload field labeled "Choose File" with the status "No file chosen". A large blue button at the bottom contains the text "register now". Below the button, a link says "already have an account? [login now](#)".

REGISTER NOW

enter username

enter email

enter password

confirm password

Choose File No file chosen

register now

already have an account? [login now](#)

Fig: Registration Page

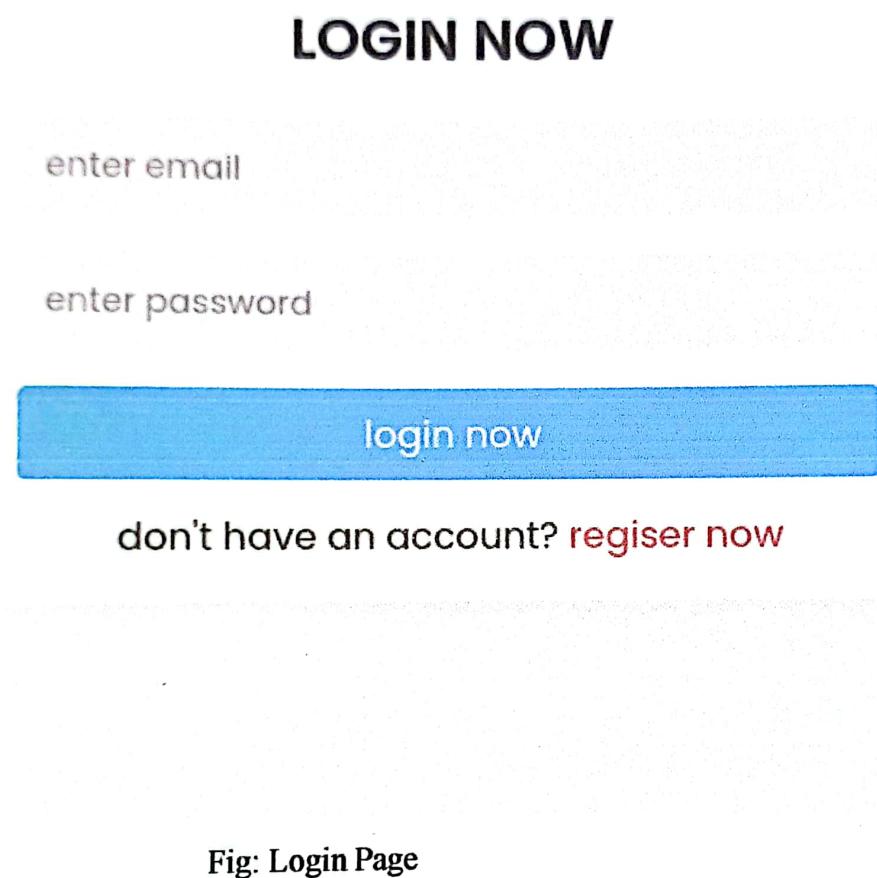


Fig: Login Page

After login user should move to the User Dashboard where he can update his profile and etc

The image shows a user dashboard interface. At the top is a placeholder for a profile picture, consisting of two overlapping light blue ovals. Below this are several input fields and buttons. On the left, there's a text input labeled "username:" followed by a placeholder "enter username". To its right is a password input labeled "old password:" with the placeholder "enter previous password". Below these is another text input labeled "your email:" with the placeholder "enter your email". To its right is a password input labeled "new password:" with the placeholder "enter new password". Further down is a file input labeled "update your pic:" with a "Choose File" button and the message "No file chosen". To its right is a password input labeled "confirm password:" with the placeholder "confirm new password". At the bottom are three large, rounded rectangular buttons: a blue one on the left labeled "update profile", a red one in the middle labeled "go back", and a blue one on the right labeled "Proceed".

username :	old password :
your email :	new password :
update your pic :	confirm password :
Choose File No file chosen	confirm new password
update profile	
go back	
Proceed	

Fig: Update Profile

The basic things they can learn here



4.3 Learn Page

Here he can learn many basic things that would help him to concatenate himself with other asd free childs.

Fig: Learn Page

4.4 Mini Games

Here He would find many mini games for playing

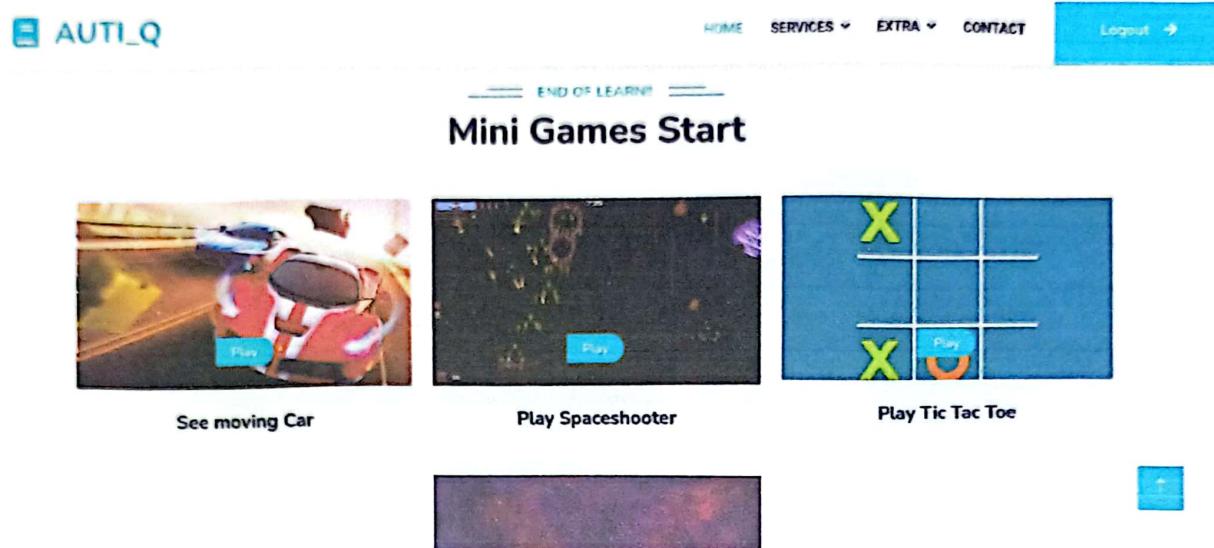


Fig: Mini Games Start

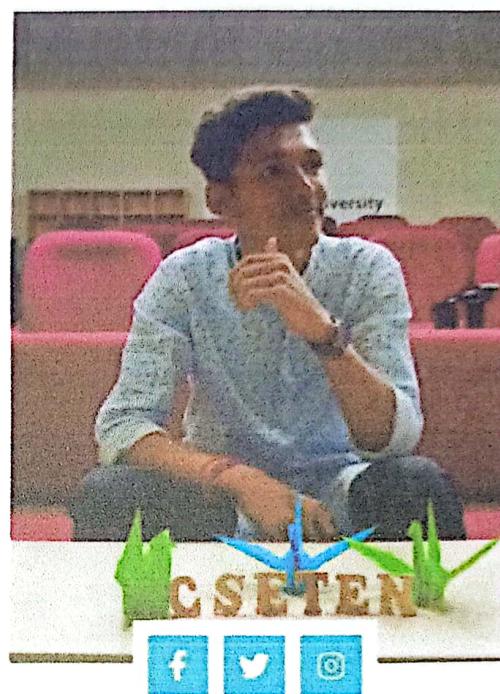
4.5 Team

The page contains team members information.



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Fig: Teams

4.6 Testimonials

Here we can record our clients feedback

The screenshot shows a section titled "TESTIMONIAL" with the heading "Our Students Say!". It displays three testimonial cards, each with a client's profile picture, name, profession, and a quote. The quotes are placeholder text: "Tempor erat elit etiam rem at clita. Diam dolor diam ipsum sit diam amet diam et eos. Clita erat ipsum et lorem et ad". A blue "Send Message" button is located at the bottom right of the card area.

4.7 Contact Us

Here the user can Contact with us

The screenshot shows a contact form titled "Contact For Any Query". It includes a "Get In Touch" section with placeholder text about an inactive contact form, and three contact methods: Office (123 Street, New York, USA), Mobile (+012 345 67890), and Email (info@example.com). To the right is a map of the Northeastern United States showing states like New York, Massachusetts, Connecticut, Pennsylvania, and New Jersey. The form fields include "Your Name", "Your Email", "Subject", and "Message", with a "Send Message" button at the bottom right.

Fig: Contact Us page

4.8 About us Page

ABOUT US

Welcome to AUTI_Q Dashboard

Tempor erat elitr rebum at clita. Diam dolor diam ipsum sit. Aliqu diam amet diam et eos. Clita erat ipsum et lorem et sit.

Tempor erat elitr rebum at clita. Diam dolor diam ipsum sit. Aliqu diam amet diam et eos. Clita erat ipsum et lorem et sit; sed stet lorem sit clita duo justo magna dolore erat amet

→ Skilled Instructors	→ Learn Basics
→ IQ test	→ Skilled Instructors Instructions
→ Mini Games	→ Feedback

[Contact us](#)

Chapter 5

Evaluation

5.1 System Evaluation

Evaluating software for accessibility is similar to website evaluation. The principles of functional accessibility apply, as do the steps of progressive evaluation - though with different evaluation tools at your disposal. This section will discuss techniques for evaluating software on various platforms. For now, Mac OS X and Windows XP/VISTA/7/8/10 will be covered.

Accessibility evaluation is somewhat subjective, with a multitude of diverse requirements that can sometimes seem at odds. To simplify the evaluation process, consider a progressive approach, performing the easiest checks first and moving on to more in-depth checks from there. Progressive evaluation for software begins with checking keyboard navigation support, checking the interface in high-contrast mode, followed by using a screen reader to check interface labels. Unlike progressive evaluation for the web, it is often not possible or helpful to look at the source code of an application. Following these checks, create a prioritized list of issues for remediation. Evaluating in this order can

eliminate the need for time-consuming evaluations when the simplest, most important accessibility support features are not present.

5.2 Acceptance Criteria

As directed by the target, this study requires product capture and analysis rather than system design and implementation. Therefore, we cannot directly judge results from the first stage of system development if we are successful or not. Great many works are left to future system developers and programmers. Whether the theoretical methodology is practiced properly evaluates the way to investigate and run analyzes to assess whether such a product can be evaluated in a more intelligent way. Adapting the evaluation, those criteria are firstly defined:

- **All objectives and minimum requirements are covered:** Go through the project, whether the outcomes of the project have matched the initial objectives and minimum requirements.
- **Functionality:** System functionality needs to be analyzed. A comparison of the potential Legal Case Management System and the current average system will illustrate the system strengths as well as opportunities for further development.
- **User acceptance:** Present the product to the potential end users as well as the system develops from us, get advice and suggestions from the resources in order to make system enhancement.
- **User involvement:** We have discussed earlier about how users can use this system. As we said that no person can access this system without getting permission from the admin.

5.3 User Interface Design

User interface design (UI) or user interface engineering is the design of user interfaces for machines and software, such as computers, home appliances, mobile devices, and other electronic devices, with the focus on maximizing usability and the user experience. The goal of user interface design is to make the user's interaction as simple and efficient as possible, in terms of accomplishing user goals (user-centered design).

Interface design is involved in a wide range of projects from computer systems, to cars, to commercial planes; all of these projects involve much of the same basic human interactions yet also require some unique skills and knowledge. As a result, designers tend to specialize in certain types of projects and have skills centered on their expertise, whether that be software design, user research, web design, or industrial design.

Good user interface design facilitates finishing the task at hand without drawing unnecessary attention to itself. Graphic design and typography are utilized to support its usability, influencing how the user performs certain interactions and improving the aesthetic appeal of the design; design aesthetics may enhance or detract from the ability of users to use the functions of the interface. The design process must balance technical functionality and visual elements (e.g., mental model) to create a system that is not only operational but also usable and adaptable to changing user needs.^[4]

Chapter 6

Testing

Software testing is the process of running a program with the objective of finding errors. This is done to improve software or find bugs in existing software. It finds software errors like whether any system or software is working properly or not. Testing is the process of checking that a software program is working as expected and meeting technical as well as business requirements. This can be done at any stage of software development. There are many types of software testing such as unit testing, performance testing, system testing, black box testing, white box testing etc.

6.1 Unit Testing

Unit testing is the process to check the independent and individual unit or module of software. Testing each module separately is called unit testing. This testing process tests whether the modules work independently. The primary goal is to take the smallest piece of testable software, isolate it from the rest of the code and check if it is behaving exactly as expected. Each unit is tested separately before integrating them into modules to test the interfaces between modules.

Each scenario of this application is tested individually and it is ensured that each module produces the desired output for the corresponding input. The application consists of various modules such as page navigation, submission of data by the user to the database, retrieval of data from the database, storage of case information, storage of various types of documents, and calendar. It is ensured that each module of this system is tested separately to get a suitable result.

It has been ensured that the page navigation is working properly, it has various buttons like previous, next, back, bill, view, submit etc., a main functionality on the button has been tested individually and all these parts are working beautifully. It is ensured that a user lawyer is able to maintain his case information correctly and manage his cases according to that information. Apart from storing the cases, it has also been checked whether the client can know the different dates of these cases.

6.2 Performance Testing

Software performance testing is used to determine the speed or effectiveness of a software program or device. Qualitative attributes of software such as reliability, scalability and interoperability may also be evaluated during this testing. The performance of a website comes into picture when some hundreds

or thousands of users are accessing the website and performance testing ensures that all the users are getting efficient results in less time. By performance testing we can estimate the maximum number of users accessing the web site simultaneously and by means of these testing results one can analyze the measures to further improve the performance of the application.

6.3 System Testing

In this test we put the software in different environments and check if the software is compatible with the new environment. Overall system testing is performed by testers. Software is usually the only component of a large computer-based system. System testing is actually a series of tests with the sole purpose of making sure the entire system is working in the new environment. Finally, checking that the software is working properly with other software/hardware systems. There are two types of system testing - black box testing and white box testing.

6.3.1 Black Box Testing

Black box testing is also known as functional testing. Black box testing is testing where the tester has no coding knowledge. In this test, we only check the functionality of the given input software and whether the output produced is working correctly. This type of test depends on the software requirements and features. A black-box can be a software system that you want to test. For example, an operating system like Windows, a website like Google, Oracle or even a database like your own custom application. Under black box testing, you focus on input and output to test the app without knowing the implementation of the software code.

6.3.2 White Box Testing

White-box testing (also known as clear box testing, glass box testing, transparent box testing, and structural testing) is a method of software testing that examines the internal structure or functionality of an application. In white box testing, the tester has knowledge of coding and internal structure of existing software whether the internal structure is correct or not. It means the tester of this system is the software developer who made the system. The tester chooses the input to exercise the path through the code and checks that the appropriate output is coming. White-box testing can be applied at the unit, integration, and system levels of the software testing process. While traditional testers considered white-box testing to be done at the unit level, it is now more often done and used for system testing. Although this method of test design can uncover many defects or problems, it is likely to miss unrealistic parts of the specification or missing requirements. [5]

Chapter 7

Future Work and Conclusion

7.1 Future Work

We can't think of our nation's prosperity keeping The ASD child's thinking as a burden on our society. We've to move with them and make them manpower. The Scope of this project is limited to users. As this is for special childs, it's different from other web or apps. The childrens who don't have problems with electronic devices can only use that. Because in some cases doctors advised not to use electronic devices.

7.2 Conclusion

The word Auti_Q stands for Autism and IQ. Autism spectrum disorder is a serious issue nowadays. Autism spectrum disorder is a condition related to brain development that impacts how a person perceives and socializes with others, causing problems in social interaction and communication. The disorder also includes limited and repetitive patterns of behavior. The children who show symptoms of this disorder have IQ levels near 0. The goal of our project is to increase the IQ level and to determine the fields of their interest.

Via our project we should try to develop the IQ level of the ASD Child's. In future we should add AI for the betterment of their learning. Let's convert them to manpower.

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