Waterford Institute of Technology

MSc in Computing

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Contents

List of Figures

Chapter 1

UX Document

1.1 Overview

In this project, I will create a personal website based on my passion for teaching. One of my passions is teaching, and I enjoy sharing my expertise with others, which will help me learn and comprehend technology better. I've previously taught coding classes to 10th grade students, and for this project, I'd like to turn this interest into a business. In this project, I want to create a personal business website where my students and customers can book hourly sessions.

1.2 Description of the project

This web application mainly deals with integrating my resources and professional knowledge and providing a learning platform to individuals who seek an extra guidance and in depth knowledge of a particular subject. Even though this is done as part of my academic assignment I consider this as a small step to my dream. The entire application is made by using WIX Website editor. The main services provided in this application are elaborated in the web page and is quoted by a certain price tag. Many modern companies in the educational industry use online medium in a large scale for educational purposes. One of the highlights of this application is that a lot of learning documents are uploaded on the guidance page which will serve as very useful to the members and also it contains many of my personal publications which are published by IEEE and Springer. There is also a chat option for clients to interact with me for pre lecture queries and further enquiries and content doubts once the lecture starts will be resolved by zoom sessions. Overall this basic application idea can be converted into a real life working model by enhancing the front end and backend with latest cutting edge technologies and I believe that it will serve as a helping tool for many individuals in the outside world and also an investment from my personal behalf.

Chapter 2

Goal

2.1 Purpose of the website

- Learning platform for students and Techies

- A Business application for Freelance Lecturers

Max 3 bullet points

2.2 Scope of the website

For each of the goal state the scope or limitations

- Learning platform for students and Techies :
  A blend of Practical and Theoretical lectures with the aid of Video presentations,Audio Lectures, Puzzles, Assignments, Mock Tests, Final Exams and also a certificate upon Completion will enable these self motivated and focused individuals to take a giant leap in their academic and professional life.

- A Business application for Freelance Lecturers :
  The world has finally given an answer to unemployment in the form of Internet where the talented and ambitious individuals can showcase their knowledge and make an income for their living. A lot of qualified lecturers who are finding it difficult to get into an academic institution where they can share their knowledge to the young generation can use this application to accomplish their goal and to support them with a constant income.

Chapter 3

Competitor Analysis

3.1 Description

- **BYJU'S** is an education tutoring software that offers free access to information for 15 days after enrollment. It first opened its doors in August 2015, with instructional content for kids in grades 4 through 12, and in 2019, an early learning program for grades 1 through 3 was created. It also prepares students for national exams like IIT-JEE, NEET, CAT, and IAS, as well as international exams like GRE and GMAT. 12-20 minute computer animation videos are used to illustrate academic courses and concepts. BYJU'S claims to have a total user base of 4 crore (40 million), 30 lakh (3 million) annual paying members, and an annual retention rate of around 85%. In 2019, the company announced that it would launch its app in regional Indian languages. It also planned to launch an international version of the app for English-speaking students in other countries. Byju's recently announced new programs in its Early Learn App for kindergarten students. In April 2021, the company also announced the launch of "BYJU'S Future School," which will be led by WhiteHat Jr Founder Karan Bajaj. The Future School will be launched in May in the United States, the United Kingdom, Australia, Brazil, Indonesia, and Mexico by BYJU'S.

- **Whitehat Junior** is an Indian edtech business and online tutoring company that teaches youngsters how to code through one-on-one live video lessons. It was founded by Karan Bajaj in 2018 and is aimed at youngsters aged 6 to 14 in nations such as India and the United States. Customers can also take AI classes, according to the company. In today's computer age, not all schools teach coding to children as early as kindergarten, resulting in a significant gap between the demands of the modern world and our children's abilities.

- **Udemy** is an online learning platform that allows instructors to create online courses on their favorite subjects. They can create courses using Udemy's course development tools, which allow them to upload videos, PowerPoint presentations, PDFs, audio, zip files, and live classrooms. Instructors can also use onine discussion boards to engage and interact with students.Business and entrepreneurship, academics, the arts, health and fitness, language, music, and technology are only few of the topics covered in the courses. The majority of programs include practical topics like Excel software or how to use an iPhone camera. Udemy for Business is a targeted collection of over 7,000 training courses on topics ranging from digital marketing methods to office efficiency, design, management, programming, and more.

3.2   Design Features

- Byjus:

  - Because the task for curating the study material is delegated to competent faculty, the end result is well-organized, in-depth content.This enables Total Syllabus Coverage.
  - The application aids Visual learning.Students learn best when subjects like physics, chemistry, and mathematics are taught using visually appealing methods rather than the outdated and ineffective chalk-board method.
  - In-built chat allows students to communicate with their personal mentors at any time. This could be done to better comprehend any idea or question in the study materials.
  - In-app calling, messaging, and chat forums are just a few of the features that third-party apps provide to help users learn.

- Whitehat Junior:

  - As soon as the chapter closes, students should know where they stand in terms of their knowledge. Test mock tests, as well as other sample and question papers from prior year examinations, are all included in learning apps. These examinations help students learn more effectively and keep track of their progress.
  - The team also provides hard copies of shipping materials, the app might include a logistics dashboard so that both the team and users can track the status of their shipments.
  - Another important feature is that parents can keep a watch over the performance and growth of their children
  - Learning applications by interactive and visual courses are very adaptable to the demands of pupils. Whitehat junior creates the curriculum based on the needs of the students.

- Udemy:

  - Users can interact with instructors through our Q&A feature available in the application.
  - The lessons can be downloaded and watched in offline mode too.
  - There is also a Mini Player and this in turn enables multi tasking while learning.
  - Viewing archived or favorite courses with just a few taps.

3.3   Functionality

- Byjus:

  - Byjus is a education tutoring software which has both Desktop version and also mobile application. It is available on both Android and Ios.This application was found by Byju Raveendran.The main functionality of this application is providing lectures in a virtual manner and is among the top online learning platforms across the world.

- Whitehat Junior:

  - Whitehat Junior is actually a sub brand of Byjus.This online coding application is meant for school kids and was developed with the belief that students from a younger age should develop coding skills which will be a basic requirement of academic qualification in the near future.More than hundred teachers who are well qualified are employed under Whitehat junior and they provide classes with online face to face video sessions.It is more of a interactive application which replaces the traditional Board and chalk method.

- Udemy:

  - Udemy moreover contains self learning courses and study materials most of which are at an affordable price value while there are also a few free courses.Udemy certifications are of worldwide value.There is also option for professors across various reputed international institutions to provide online coaching in Udemy and issue professional certificates in the name of their university.

3.4 Personal opinion

- Byjus:

  - The most significant benefit of using Byju's is the decreased cost. Byju's courses are less expensive when compared to those in major cities. It is also cheaper compared to tution classes and also saves travel time. Students can access the content and learn from anywhere in the world and moreover students can learn with fun.

- Whitehat Junior:

  - At an early age, WhiteHat Jr. claims to empower and increase a child's confidence. They help children to learn about logic, structure, sequence, and algorithms in order to create creative products such as apps and animations.For children, the entire learning process is so exciting that they pay close attention to everything. These classes not only motivate students to learn something new, but they also teach them how to learn with patience and concentration.

- Udemy:

  - Udemy has around 600 free courses on a variety of topics ranging from wordpress to fitness.Every course you've purchased on Udemy will be available to you for the rest of your life.There are over 183K items over 13 categories and dozens more subcategories of courses.

Chapter 4

User Experience

4.1 Persona

The objective of this assignment is to build an application architecture that demonstrates how serverless functions can be used to build loosely coupled systems

4.2 Scenarios

Click here to watch Demo

The figure 5.1 describes the deployment of a serverless web application. The user tries to add an invoice containing username and amount to the database using the front end of the application. In the back end the API gateway invokes the Lambda function to write the data given by user to the DynamoDB. When an insert happens in the database another Lambda function is invoked to check the amount of invoice. Invoice with zero amount is given to an SNS alert topic which further send an email to the subscribers of the SNS topic and also add to the SQS queue. And finally, a JavaScript program is executed at the end to retrieve the messages from the SQS. The components in the architecture are explained in detail below:

- S3 Bucket : The application of invoiceTracker is stored in the S3 bucket and is used when we create the App

- AWS Amplify : The application uploaded in the S3 bucket is used inorder to create the App using AWS Amplify.

- API Gateway : A POST method is created inorder to get the data from the user.

- Lambda - A : This Lambda gets triggered by the API gateway and update the data from the user to the dynamoDB.

- IAM - A : This is the access permissions given to lambda A in order to write data to the database. A new inline policy is created alongside the basic lambda execution roles by adding a new JSON file to the policies which allows permission to write, delete, read, scan, querry and update the table namely InvoiceTransactions.

- DynamoDB : A table name InvoiceTransactions is created which store fields namely, username, timestamp and invoice amount. The NEW_IMAGE streaming is enabled in dynamoDB and this helps Lambda to read new values from the table.

chapters/asg2.drawio.png

Figure 4.1: Description of the project

- Lambda - B : This Lambda function gets triggered when an insert happens within the dynamoDB. The Lambda have access to read item from the table InvoiceTransactions and also have access to the SNS topic and there by can send notifications to SNS subscribers. It also have access to SQS because of whcich the notification is saved in a queue in SQS.

- IAM - B : This is the access permissions given to Lambda B inorder to read data from table in dynamoDB and send notification to SNS and SQS. The JSON file in the inline policy gives access to DescribeStream, GetRecords, GetShardIterator, ListStreams for the table InvoiceTransactions NEW_IMAGE stream and also allow full permissions to publish item to SNS topic.

- invoice_alert - SNS : An SNS topic is created inorder to get notifications regarding Zero invoice transactions. Email notification is chosen for this project. So, whenever a zero invoice transaction happens a new notification will be send out as an email.

- invoice_alert_queue - SQS : In this the notification send out due to zero invoice alert are stored.

- Receive Messages : The messages from the queue can be retrieved using a program written in JavaScript. While executing the program the details of the message in queue will be printed in the console.

Chapter 5

Content Strategy, Navigation Architecture and Visual Design

5.1 Content Inventory

The objective of this assignment is to build an application architecture that demonstrates how serverless functions can be used to build loosely coupled systems

5.2 Sitemap

Click here to watch Demo

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5.3 Wireframe Sketches

5.4 Wireframes using a UX tool (Architectural Blueprints)

5.5 Mock-Ups using a UX tool

5.6 Screen Capture

Chapter 6

Additional functionality

6.1 Usability Heuristics

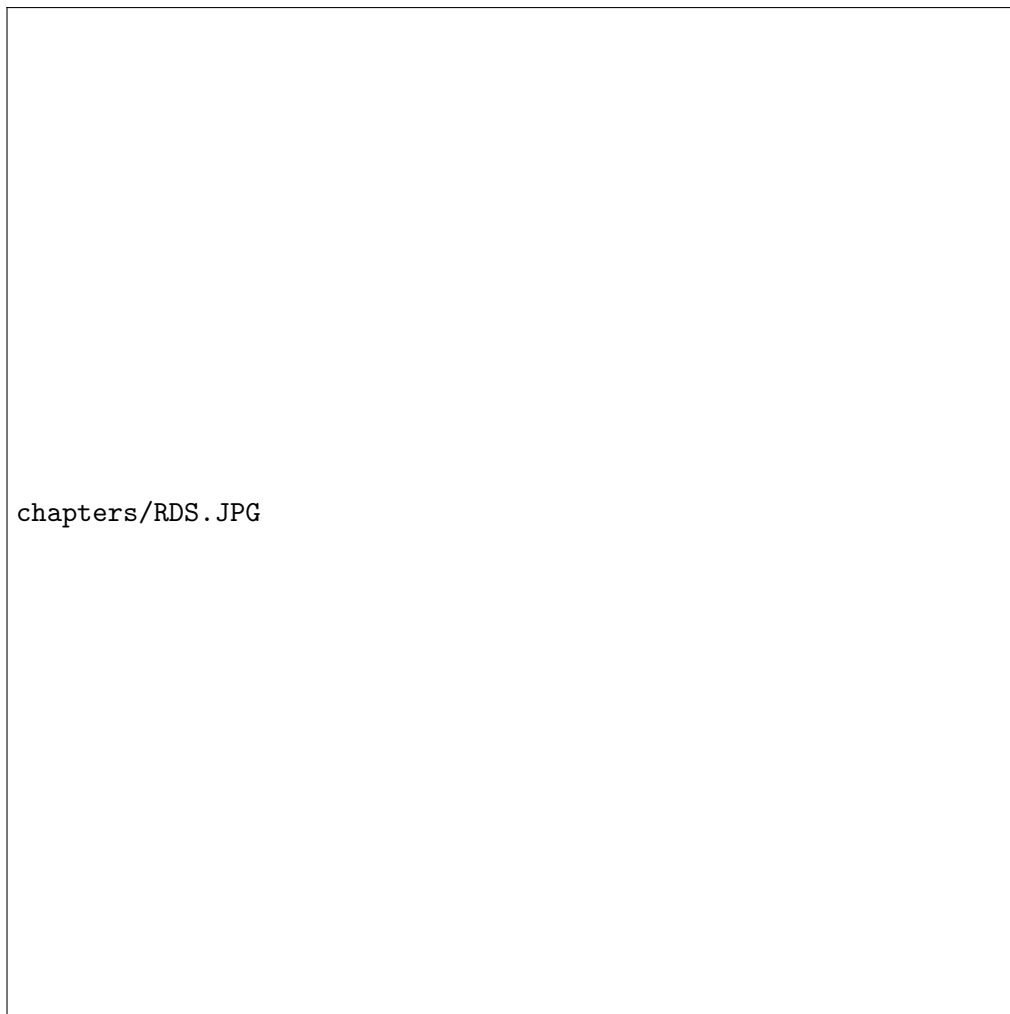An RDS database is deployed (**? ?**) in the application to maintain the record of user address details.

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chapters/RDS.JPG
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Figure 6.1: RDS database
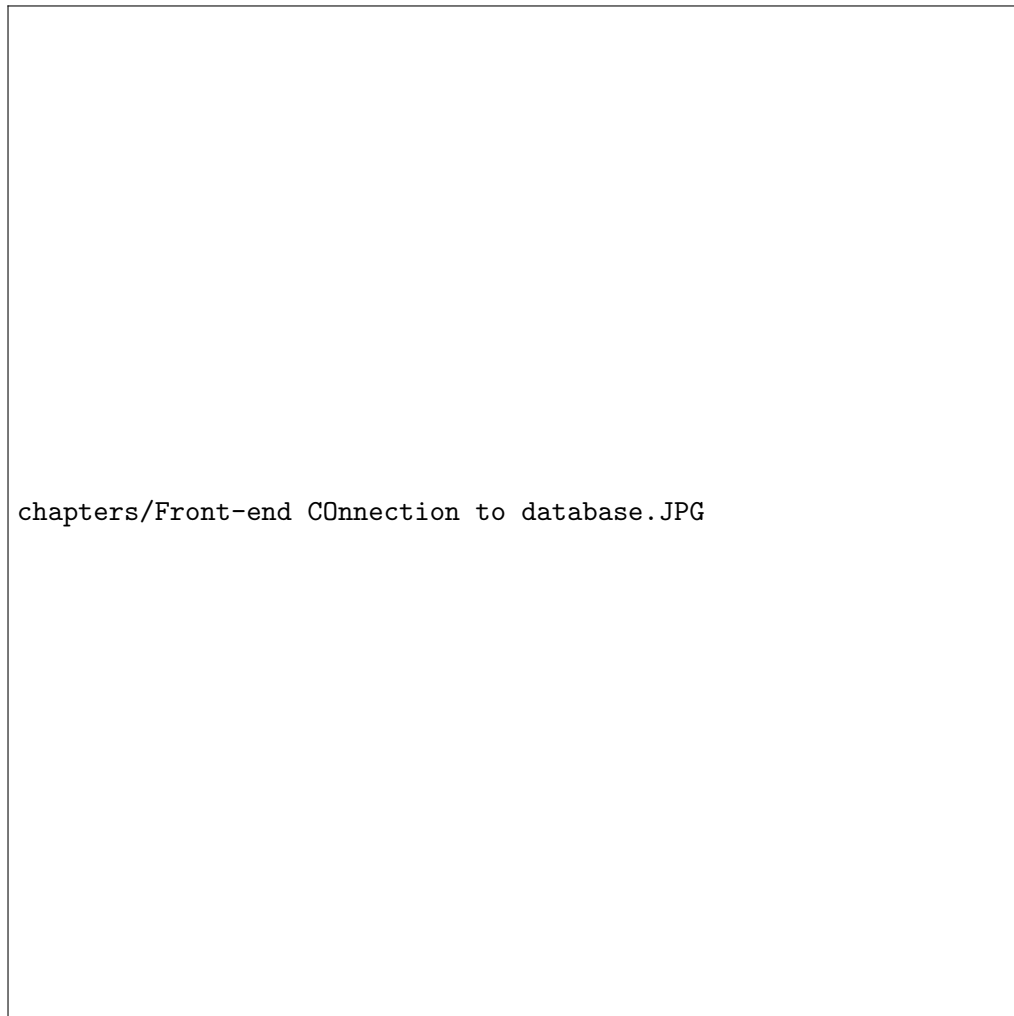
chapters/Front-end COnnection to database.JPG

Figure 6.2: Front-end connection to the database

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