Higher Diploma in Science in Computing

Software Development

**Interim Report: Web Application for a Restaurant**

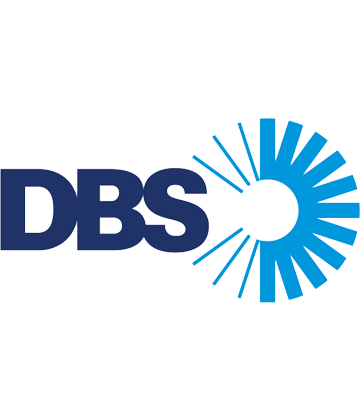
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July 29th, 2022



[Acknowledgments 2](#_Toc109209684)

[Introduction 2](#_Toc109209685)

[Background 3](#_Toc109209686)

[Specification and Design 4](#_Toc109209687)

[Project Testing and Evaluation 7](#_Toc109209688)

[Demonstration of Progress 8](#_Toc109209689)

[Future Work 8](#_Toc109209690)

[Appendices 8](#_Toc109209691)

# Acknowledgments

I would like to start my Interim Report by thanking Dr Mehran Rafiee. It was a challenge doing this Project, and Dr Rafiee support was essential for accomplishing it, answering all my questions, providing useful advice and helping me design a path on what I needed to do in order to achieve the final goal.

# Introduction

The aim of my project is to develop a Web Application that integrates and deliveries specific information to different levels of users. The business case used is a restaurant where it is intended to correctly forward customers' orders and bills to the right staffs. Also providing reports and wide/real-time information for the business admin.

The main idea is to use a database where all the data will be stored and treated accordingly. When a customer sends an order, it will take its details and send them to users who are responsible for prepare and pack the meal, and to the responsible for billing the order and forward it to delivery or pickup.

The scope of this project is to

* Allow customers sending orders by signing and logging in their account
* Correctly forward the customer order to the kitchen staffs, using kitchen login access
* Correctly forward the customer order to the floor staffs, using floor login access
* Feeding in real time administrator’s reports, using admin login access

I approached this project with all knowledge obtained in my software development course and some working knowledge of Data Analytics. Currently I am working using MySQL for testing and debugging 2nd level issues on front and backend.

# Background

As I am a cooking enthusiast and someday when I get retired, I have a dream of having a small restaurant, serving the local community with good food, and offering pleasant moments with good wines and good chats, my Italian roots are taking me to this plan.

Thinking on this and motivated by what I have learnt on the past two years on the Science Computing – Software Development course, I decided to create this web application designed for my virtual and maybe future restaurant.

It’s also thought for a small business where through this application I can manage the essential roles on the business, such kitchen, floor, orders and a wide administrative perspective for sales and orders amounts, etc.

The benefit offered by this project, as I am aware that are many applications and companies delivering something very similar, is to provide an exclusive and personalized product that meets the specific needs of a given business requiring just internet connection and tablets, smartphones or computers.

Also the method chosen for this project and develop this web application, which is Agile meets the objective in delivering a personalized product to the client. I see this method as the best option for offering flexibility in responding to changes due the client’s demand and client collaboration, the Agile model also was the best option when thinking on the resources and timeframe I had for the whole project.

Then using most often the approach below, it gave me freedom for create and implement concepts during the all the processes.

As mentioned above, some existing relevant and similar software/ companies I can mention and, I wouldn’t say that inspired me, but I used for checking how they works and offer their services are:

* Deliveroo - <https://deliveroo.ie/>
* Toast - <https://pos.toasttab.com/>
* Open Table - <https://www.opentable.ie/>

# Specification and Design

This project goal was to create information system for restaurants, where providing a holistic service from customer to the owner aiming the business development, best customer experience and sales increase.

It is meant to be an essential tool for the company’s routine, handling in store and on line orders, reservations, kitchen tasks, billing report, sales reports, etc.

It provides different access levels for users as admins, floor staffs, kitchen staffs and customers and the application integrates a database and handle data accordingly due a given request. It’s required to the application do:

1. Customer’s Experience

* Display correctly the restaurant’s info and images
* Display correctly the restaurant’s menu, getting its data from database
* Display correctly the restaurant’s location via Google maps API
* Accept customer’s signup recording their details on the correctly tables in the database
* Accept customer’s login crossing the login form details with the correctly data from database
* Accept customer’s review by five stars rating model, recording its details on the correctly tables in the database
* Display correctly the customer’s reviews on the home page for all website visitors
* Accept customer’s orders recording its details on the correctly tables in the database
* Display correctly the order’s items details when placed by the customer
* Display correctly the order’s total amount to pay when placed by the customer

1. Kitchen Staff Login
   * Display correctly a list of incoming orders of the day evidencing whether is delivery, pickup or table order.
   * Allow staff to mark the order as ready
2. Floor Staff Login
   * Display correctly a list of all orders of the day
   * Allow staff select an order and display the total amount to charge for billing the customer
   * Allow staff manage the reservation’s list and enter reservations details on the system
   * Display a list of all reservations by a selected day
   * Display correctly a list of all orders being prepared on the kitchen
   * Display correctly a list of all orders completed by the kitchen and ready for the customer
   * Display correctly a separated list for delivery, pick up and in tables orders
3. Admin’s Login
   * Welcome the admin user by its name on the main Admin page
   * Full access for kitchen and floor logins, with write and read permission to all details for each in real time by clicking on their respective shortcuts on main page
   * Display correctly sales amount and quantities reports
   * Display correctly an overview (sales total amounts, sales total quantity, total number of orders, number of orders on kitchen, etc) for the current day in real time
   * Allow managing the menu items using CRUD for editing, adding and, deleting
   * Allow managing staffs by adding, editing and, deleting user’s
   * Allow replying the reviews and display the reply correctly and relating it to the specific review

The application is being developed using the following resources:

* Heroku – Cloud Application Platform

I have opted to use Heroku rather AWS or Azure for just two basic and essential factors, simplicity and cost. This platform offers almost everything I need to develop and deploy the application. With an app-centric approach to software delivery Heroku allowed me to focus on creating and continuously delivering my application with no major concern on servers or infrastructure.

It also provides a range of data services and 3rd party cloud services that can be used for improving the application. There’s also a small elasticity, up to 1GB provided and the possibility to deploy from Git. It is all at no cost.

* Python – Back end main language

Python is the coding language used for this application back end design for a few reasons, but the main factor is that the language that I can say I effectively learned during the course. Of course it is also an Object Oriented Programming language and meets my application requirements, and the last but not least I have to mention Python simplicity as well.

* Flask – Web framework

Flask is the framework used in this project as I have worked with it before during one of the subjects studied. Same as Python, Flask attends perfectly my application requirements and is simple to use on such small projects.

* HTML, CSS and JavaScript – Main front end

For obvious reasons, the front end is using the standard languages HTML, CSS and JavaScript. I am using and demonstrating what I have learnt on Web Design classes, but I wish I have more time to expend on my website design.

* PostgreSQL – Database

Having done a similar project I have completed for my advanced programming classes, where I used SQLite3 which is not good for production as it runs in memory, and backs ups the data in files on disk. This is a great strategy for development, but cannot be applied in production, because the data written on it would be lost in up to 24hrs as Heroku, the cloud provider which will host the application, has an ephemeral filesystem and all contents are cleared periodically.

Then I had the only option for the PostgreSQL, which was the best alternative, in terms of cost and reliability, offered by Heroku.

* GitHub – Project’s management repository

Again for obvious purposes, I am using Git system for managing my code versions and keeping track of its source history. As mentioned above, Heroku integrates very well with GitHub, which I also have used before and I was comfortable configuring and managing all it’s features I need.

* PyCharm – IDE

The option for PyCharm was taken because in my current job position I use some other applications from the same developer and I am used with their tools and system. Also it integrates very well all the features I need for my project in just one IDE, such as python files, html, CSS, JavaScript, etc. It works very well with Git and Heroku, making the first setup and the daily tasks much more handy and easy.

* Pg Admin 4 – GUI for monitoring and managing PostgreSQL database

An intuitive and hands on interface for creating, monitoring and managing the database that I am using.

* Selenium – for automated tests

Still not used so far, but I have plans to use Selenium for testing some features on my application. The option for Selenium might change as I am still evaluating what is the best option in terms of simplicity, cost and efficiency.

* Google Chrome and Microsoft Edge

The application is designed for running on every browser available, but tests and validations were made on Google Chrome and MS Edge.

# Project Testing and Evaluation

At this point I haven’t used any testing and evaluating software for my application. Of course I am testing it manually after any new feature is deployed, but as mentioned on the previous topic, I have plans on using some software for testing few features on this application.

Also, after starting the project and doing some research about the best way for creating a booking system, where all data should be recorded and catch from database, I am at this moment tending to not go ahead with this feature on my app, and there are some reasons for this, such:

* *Not used in real life* - I can see that in real life, most of restaurants uses a 3rd party company for managing their booking system, the company’s name is OpenTable and there’s no free API for applying on my project
* *Complexity* - The complexity on creating and codding this booking system might impact on the completion of other features on the website
* *Timeframe* - Short timeframe for creating, design, codding and delivering everything by only myself

The usage of PostgreSQL was making me struggle in creating an entity-relationship, when creating tables and using foreign keys, I was getting an error message stating that it wasn’t allowed. Actually, as the application will deal with a small number of tables, I don’t fell a real need for using ER model.

I am aware that it is be the best approach use entity-relationship model and I should do it, but again due the short timeframe I have, my option was to proceed with the project and if I have any spare time I can modify the tables and database accordingly later.

Some other weakness on the current application is the login system I have created, as at this moment is only takes info that are recorded on the database and compares with is entered by user on login form. It does not encrypts the user data, and is something on my radar for having a look and try to fix after some other main features are completed.

# Demonstration of Progress

The project is actually at almost 40% from its completion, there’s still loads of work for doing on it.

But I think the progress is in a good flow, as the application’s “spine bone” is ready!

Most of the HTML and CSS to be used is ready, the database is currently being worked, the login system despite the issue mentioned previously, is working and when an user logs in the system will display the relevant information accordingly to user’s permissions.

# Future Work

From now on the objective is working and completing the following:

* Complete the customer’s review feature
* Complete the Admin user’s page:
  + Manage the Menu page – allowing to add, edit and delete items
  + Display Admins info as sales, orders, total sales amount overviews
* Complete the Floor Staff user’s page
* Complete the Kitchen user’s page
* Complete the Order’s page:
  + Creating the tables for managing the orders data and delivering it accordingly to users and reports
  + Using CRUD for allow customer place an order via form and record this data into the database
  + Displaying correctly the total order’s amount to pay when it is placed

Appendices

Please find below the application URL, a admin access user detail, GitHub public repository for this project, URL for Heroku application overview.

[https://github.com/Wellington-Nodari/reggio-cantina.git](https://github.com/Wellington-Nodari/reggio-cantina.git" \t "_blank) - Public repository

<https://cantina-reggio.herokuapp.com/>  - Admin permissions – user: [tn@mail.com](mailto:tn@mail.com) pwd: 123

<https://dashboard.heroku.com/apps/cantina-reggio> - I have added “mehran.rafiee@dbs.ie” as a collaborator on the project to have access on it.