

Shohoz Food
Internship as a Software Quality Assurance Engineer

by

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A thesis submitted to the Department of Computer Science and Engineering
in partial fulfillment of the requirements for the degree of
B.Sc. in Computer Science


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Declaration

It is hereby declared that

1. The report submitted is my own original work while completing my degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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Approval

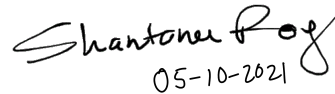
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Abstract

Shohoz Limited has developed a mobile app to provide different kinds of services to the people of Bangladesh. There are several different services, all available in just one single app. Some of the services are ride sharing, food delivery, truck rentals, ticket booking, medical consultation and so on. Food related businesses and ventures have in most cases been very successful in Dhaka. On top of that, after the Covid-19 outbreak, online food delivery has become an everyday necessity for a majority of Dhaka's population. Taking this opportunity, Shohoz Limited decided to improve on their food app to capture the market as much as possible. I was designated as a quality assurance engineer intern under the 'Food' project of Shohoz Limited. My six month long internship has taught me a lot of things that could only be learnt through actual work experience. Software testing was quite fun for me, and along the way I learnt how to use Postman and test APIs through it; how to make test cases, execute them, then file a report, how to communicate the test cases and bugs that I found back to the dev team, how to improve on the codes that are present to make the feature more favorable or what possible steps could be taken to remove a bug, and finally I have also learnt how to run automated tests. The first 2 weeks were quite easy as my supervisor was just showing me around and taught me the basics of testing and the requirements to start testing. As time went by, the work loaded slowly increased, I learnt more, I met more people and got to work on many different parts of Shohoz Food. Regardless of how difficult my work became, I enjoyed it and appreciated the idea that I could continue to learn new things while working. If anyone ever asks me, I will ten out of ten recommend internships; as exhausting as they may be, you learn a lot of new things and along with that get hands on experience.

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Table of Contents

Declaration	i
Approval	ii
Abstract	iii
Acknowledgment	iv
Table of Contents	v
List of Figures	viii
1 Introduction	1
1.1 About Internship	1
1.2 About this Report	1
1.3 Objective	2
1.3.1 Aim	2
1.3.2 Specific Goals	2
1.4 Methodology	2
1.4.1 Primary Data	2
1.4.2 Secondary Data	2
2 Company Profile	3
2.1 Overview	3
2.2 Vision and Mission	3
2.3 How Does Shohoz Limited Work	3
2.3.1 Partners and Sponsors	3
2.3.2 Program Management	3
2.3.3 Product Ownership	4
2.3.4 Quality Assurance	4
2.3.5 User Experience Design	4
2.4 What Shohoz Limited Do	4
2.5 Software Development Process	4
2.5.1 Requirement Identification	5
2.5.2 Context and Process Capturing	5
2.5.3 Proof of Concept (POC)	5
2.5.4 Eventual Releases	5
2.6 Recruitment Process	5
2.7 Technology and Framework	6

2.8	Projects	6
2.8.1	Shohoz Food	7
2.8.2	Shohoz Health	7
2.8.3	Shohoz Learn	7
2.8.4	Shohoz Railway Ticket	7
3	Training Phase	8
3.1	Overview	8
3.2	Getting Familiar with the QA Scenario	8
3.2.1	Getting to Know the Beta App	8
3.2.2	Using Postman	9
3.2.3	First Case of Boundary-Value Analysis Testing	11
3.2.4	Equivalence Partitioning Testing	11
3.3	Tutorials and Assistance	12
3.4	Communication and Meetings	12
3.5	Work Environment	12
4	My Introduction to Testing	13
4.1	How it started	13
4.2	Features, Bugs and their Fixes	13
4.3	Creating My Own Testing Environment	13
4.3.1	Testing the Restaurant Panel	14
4.3.2	Calculating Expenses	14
4.4	Order Placement	14
4.4.1	Order in Order Management Panel (OMP)	14
4.4.2	Order Fraud Check	15
4.4.3	The Provider App	15
5	Coupons	17
5.1	Coupon Testing	17
5.2	Features of Coupons in Shohoz Food App	17
5.2.1	What exactly are coupons in the Shohoz App	17
5.2.2	How does a coupon work?	17
5.2.3	Examples of Coupons	19
5.3	Steps and Cases to Test the Coupons	21
5.3.1	Coupon Application and Calculation Test	21
5.3.2	Coupon Status during Order Migration	23
6	Order Management Portal (OMP)	25
6.1	What is the OMP	25
6.2	Important Features of the OMP	26
6.2.1	Placement of Orders	26
6.2.2	OMP Bucket Count and Auto Updating Statistics	26
7	The Shohoz Food App	28
7.1	How Does Shohoz Food App Work?	28
7.2	Things to look around in the Food App	30
7.3	Incorrect Order Status Updates on User App Due to Desynchroniza- tion	30

8	Pre Order	33
8.1	Pre Order User App Tool tip View and Menu	33
8.1.1	Tool tip According To Different Restaurants	35
8.1.2	Tool tip Issues and Bugs	36
9	Restaurant Opening and Customization Menu	39
9.1	Restaurant Open Criteria	39
9.1.1	Restaurant Timing	39
9.2	Customization Menu	40
9.2.1	A specific category to ‘others’	40
9.2.2	‘Others’ to a specific category	41
10	War Rooms, Dry Runs and Automation	42
10.1	War Rooms	42
10.2	Dry Runs	42
10.3	Automation (Automated testing)	43
11	Self-Assessment	45
11.1	Overview	45
11.1.1	Attitude	45
11.1.2	Ability to learn	45
11.1.3	Dependability	45
11.1.4	Initiative	45
11.1.5	Quality and quantity of work	46
11.1.6	Relationship with others	46
11.1.7	Overall performance	46
12	Conclusion	47
	Bibliography	49

List of Figures

3.1	Admin panel to modify restaurant service hours	10
3.2	Postman API testing environment	10
3.3	Order value limit	11
4.1	Restaurant Panel	14
4.2	Fraud Check Table	15
5.1	Coupon basic details	18
5.2	Coupon logic and settings	18
5.3	Coupon duration and compatibility	19
5.4	User app checkout page with discount coupon applied	20
5.5	Highlighted text is seen on top of the items and the relevant discounts are shown	21
5.6	You can see the relevant discounts added to the invoice after being added to the cart	22
6.1	The Order Management Portal	25
6.2	Some Features of the OMP	26
7.1	Shohoz Food App Homepage	29
7.2	Shohoz Food App Restaurant Menu	29
7.3	Order Status Tool tip	30
7.4	Order Details Page	31
7.5	Cases for Real Time Order Status Update on the User App	31
8.1	Pre order menu and tool tip	34
8.2	Tool tip after a pre order time has been selected	35
8.3	Admin panel to edit ‘Scheduled Hours’; which sets the pre order time accordingly	36
8.4	Item is unavailable as the pre order time selected is not in-between the scheduled hours	36
8.5	Regression test for positive path of pre order time selection and menu item availability (expected results in the brackets)	37
8.6	A few of my test cases before conducting full scale testing	37
9.1	Criteria for restaurants to be shown on the app or be ‘Open’	40
9.2	The 3 main customization criteria	40
9.3	‘Others’ to add-ons test cases	41

Chapter 1

Introduction

1.1 About Internship

An internship provides students and fresh graduates alike a chance to get suited to practical work space practices and be able to implement their knowledge in real time. Students get the opportunity to gain experience that is related to their field of study. This essentially helps the student to transit into the practical world of work from their academic world. Alongside that, the companies themselves will know their new intern better and will be able to allocate the intern according to their needs where the intern is best suited. Keeping all of this in mind, an internship also adds to a student's work experience and this add up to the intern's CV which eventually makes it worth a lot more, hence provide great job opportunities in the future. Internships are slowly gaining popularity and some students prefer them over the completing of writing a thesis paper. In BRAC University, it is mandatory for students to either complete an internship or to write a thesis paper. Though there may be fewer number of students opting for internship from BRAC, the ones who want to pursue and internship receive adequate support from the institution and are encouraged to take in as much experience and information from the work environment as possible. Students are free to choose any specialization for their internship as long as it is relevant to their major. Internships must be 6 months long at a reputable company and students must complete over 72 university credits in order to be eligible. As a student of BRAC University, I opted for an internship over writing a thesis paper. I chose Shohoz Limited as my internship company. Shohoz Limited is an online on-demand service provider, alongside that they also provide rentals and reservation based services. It is a local company that is well known throughout Bangladesh. I am hoping to take away as much knowledge with me as I can so that it benefits me in the future academically and career wise.

1.2 About this Report

As this internship is considered to be a mandatory course to complete my bachelor's program, I have to submit a report based on which I will be evaluated my BRAC University. In this report, I have written about the environment and culture of my work place. I have also written about what I have learnt and about my experience at Shohoz. It will provide a detailed overview of what I have been doing as an intern and the project I have worked on.

1.3 Objective

This report aims to provide its readers with the following details:

1.3.1 Aim

The main aim of this report is to portray my work experience and the knowledge I gained.

1.3.2 Specific Goals

The specific goals for this report:

- Portray the company profile in details
- Describe the work environment
- To put forward all the services Shohoz Limited provides to its customers
- Explain the type of work Shohoz Limited does
- To show what I have learnt through the duration of the internship
- To explain in details all the work I have done on the project assigned to me

1.4 Methodology

The following report is mainly focused around my work experience and what I learnt for the duration of my internship at Shohoz. Most of the data and information provided are taken from my personal experience. Alongside that some information has also been taken from specific websites. Most data has been collected from the following:

1.4.1 Primary Data

- My practical experience from work
- Discussions and lessons taken from colleagues and team leaders
- Seminars and team meetings

1.4.2 Secondary Data

- Shohoz Limited official website
- Internet

Chapter 2

Company Profile

2.1 Overview

Shohoz Limited is mainly an online on-demand service provider, who alongside that provides rental, and reservation based services. They provide several services such as online food ordering portal, buying bus, train and ferry tickets, ride sharing, car rental, truck rental and even online medical consultation. All of these services are available on a single app called 'Shohoz' which can be found on Google Play store or the Apple store. Shohoz Limited was founded in 2014 with the goal of making life for the people of Bangladesh easier. Shohoz Limited, being situated in Gulshan, offers a very work friendly environment where a team of experienced and hardened developers produce excellent software and solutions for their consumers to use.

2.2 Vision and Mission

Shohoz Limited has aimed to become one of the top on- service providers of the country. Their mission is to provide top class services to the people of Bangladesh.

2.3 How Does Shohoz Limited Work

A company needs a proper setup to be able to bring out the best and provide the best. The following structures will explain how Shohoz Limited functions through the hard work and dedication of the talented and experienced developers and engineers on the team.

2.3.1 Partners and Sponsors

Shohoz Limited's sponsors' and stakeholders' information are mainly confidential. However, they also have a say in how the product will be shaped and executed.

2.3.2 Program Management

Shohoz Limited's current growth efforts are supervised by the "Program Manager." On a professional basis, this individual is the main point of contact and should be

engaged in all technical correspondence. According to the Product Owner's specifications, the Program Manager is in charge of delivering and developing Quality Assurance and Customer Interface Design.

2.3.3 Product Ownership

The customer selects a "Product Owner" who will gather specifications from all stakeholders on a daily basis and disseminate the information in an orderly manner. Product owners are mainly the investors and stakeholders of Shohoz.

2.3.4 Quality Assurance

Software testing or quality assurance is characterized as a process for ensuring the quality of software products or services offered to consumers by a corporation. Quality assurance is concerned with making the software production process more reliable and successful in compliance with the quality requirements developed for software products. QA Testing is a common term for Quality Assurance. In Shohoz Limited, team leaders assign QA engineers to individual projects accordingly.

2.3.5 User Experience Design

User Experience Design is a creative practice whose ultimate goal is to create a framework that provides a positive user experience. The UXDs designed by Shohoz are mainly the ideas of project managers and eventually with the feedback of stakeholders, investors and users.

2.4 What Shohoz Limited Do

Shohoz Limited provides several different kinds of services to the people of Bangladesh. Their most common ones being on-demand services like online food delivery and ride sharing. However, they also provide services like car and truck rentals, ferry and train tickets, as well as medical consultancy upon reservation. All of these services are provided via one super app. This app, having several subdivisions, is planned and built by experienced project managers, team leaders and software developers. Investors and stakeholders provide them with the basic need, and the Shohoz team gets to work to provide the absolute best and state-of-the-art services to its customers.

2.5 Software Development Process

The software development framework divides software development work into stages comprising tasks in order to improve planning and management. It's commonly known as software development life cycle. The approach could require the pre-definition of unique objectives that a project team would build and finish in order to produce or sustain an application. When Shohoz Limited implements their programs, they still pursue this creation process. They use agile framework to ensure that project specifications are fully incorporated. Shohoz Limited's creation phase is described in the steps below.

2.5.1 Requirement Identification

Since Shohoz Limited is an on-demand service provider, they usually do not have any clients. However, the business team of Shohoz Limited requires new ideas, updates, and services to be provided. Therefore, when such a request is passed, the development team gets to work but identifying the needs and wants of the business team. They evaluate the business requirements, brainstorm ideas, and discuss possible outcome and possible obstacles. All of this when prepared and documented, different teams get to work to deliver the needs of the Shohoz Limited business team.

2.5.2 Context and Process Capturing

Several things are taken into consideration before the start of a development phase. Research needs to be done on a handful of aspects. Hence a product manager is assigned who will look into and form a report of what will suit the business context, what resources to use in the process, what their own software will provide and for whom, who are the competitors for the product and what is the ultimate goal for this project. Having all of this information collected will allow the manager and software architects to form a framework on how to proceed, which methods to follow and eventually define a proper end product for the business team.

2.5.3 Proof of Concept (POC)

Experienced members of the development team are granted access to an off-site team as well as the first prototype apps. To satisfy the demands of customers, the whole team works to discover new solution processes through research and development.

2.5.4 Eventual Releases

Since Shohoz Limited uses agile software development process, once the development starts, it receives eventual releases from development stage, to beta stage, to product stage. Then an abstract is made, report is written, and the product is tested on various levels using the best available technology at hand.

2.6 Recruitment Process

Applicants must provide the HR with their resume and a cover letter. Upon acceptance of that, there is a small on call interview just to break the ice and a later time is fixed for a face to face interview. However, in my case, since a pandemic was going on, they took an online interview for me. The senior vice president himself took my interview. The interesting thing about the interview at Shohoz is that they look at what the applicant will be good at instead of just filling in a vacancy. They asked me several questions about my area of interest and based on that they allocated me to the QA department where they believe that I will perform best. Alongside academic and work experience, they also wanted to know about my everyday life, as in what I do for entertainment and me as a person. It was a very interactive and interesting interview.

2.7 Technology and Framework

The following software, tools and frameworks are used in the development process of Shohoz Limited:

- .NET Core 5.0 as the development SDK and Runtime
 - Used as C environment
- MongoDB 4+ as the primary database
- RabbitMQ as the message broker
 - RabbitMQ is used to make all requests and queries asynchronous in a system
- REDIS as the high-performance key value storage
 - This is used as a dictionary to keep data and information stored against a JSON ID so that it can be retrieved extremely fast
- Azure IoT Hub as the real time event broker
 - Azure IoT is mainly used to track Shohoz Food deliverymen in real time (+5 seconds) to get their location and whereabouts. The data is then stored in REDIS
- Proprietary enterprise service bus
 - A service bus that has been developed by Shohoz developers
- ASP. NET Core 5.0 for the web server API
 - Used to write web servers
- Docker as the application process container
 - Docker is primarily used to host deployments of new updates
- C as the primary software development language
- Microsoft Visual Studio Community Edition and Microsoft Code as the primary IDE
- Git as the source control system

2.8 Projects

Shohoz is currently working on several projects. Most of them are confidential and are not for public disclosure until further notice. However, some of these project information are available for the public.

2.8.1 Shohoz Food

Shohoz food is currently the most important project of Shohoz Limited. It is an ongoing project where the food app has already been released. However, they are revamping the whole food section to provide a much better and smoother user experience. The goal of Shohoz food is to provide food quickly and efficiently to the users when they order.

2.8.2 Shohoz Health

Shohoz health is an undergoing project as well where improvements are being made to ensure that the users get a proper smooth interactive and useful session with the medical experts at hand.

2.8.3 Shohoz Learn

Shohoz learn is their newest addition to the super app. It is still under construction. The aim of this app is to give access to different types of books to its users according to their needs. The books will mainly be academic as the goal is to ensure everyone receives proper education.

2.8.4 Shohoz Railway Ticket

Shohoz Railway is an oncoming project which has not begun yet. The government has just appointed Shohoz, however no work has started yet. Shohoz is looking to start as soon as the Bangladeshi government gives the green light to start.

Chapter 3

Training Phase

3.1 Overview

Being able to work as an intern in a company is a big step forward in one's academic life as well as their career. Being able to get work experience is a big plus nowadays when the competition for job market is high. It also helps students transit smoothly into the work environment when they are finally finished with their academics. Applying theoretical knowledge in real time is a challenge on its own. Industry practices also vary and it's an important note to pick up. I had joined Shohoz Limited as an intern and has been designated in the software quality assurance department. This internship is a graduation requirement for BRAC University and alongside that it is the perfect opportunity for me to learn various new things and gather valuable experience while working here. As I started out, I hardly had any idea how work places function, that too during a pandemic. My supervisor from Shohoz guided me through every step and made the process very easy. This was not an official training phase as at Shohoz Limited, they put interns directly to work. However, my supervisor walked me through several phases of my internship so far. I have attached several screenshots throughout the report, however due to confidentiality, I will not be able to attach certain parts of the panels I work on.

3.2 Getting Familiar with the QA Scenario

Before I was set out to work, I was told to study a few important terms and methods. I had to download the Postman software for windows. I followed tips and tricks my supervisor gave me and also followed a course on Lynda.com to get familiar with the software. I was also recommended a book called "Foundations of Software Testing" by Dorothy Graham. Initially I had to get to know in-depth about Boundary-Value Analysis and Equivalence Partitioning Testing. When applied these methods are very simple in reality.

3.2.1 Getting to Know the Beta App

On my first day of internship, my supervisor gave me access to the Shohoz beta food app, and told me to just explore and see what errors and bugs I find. On a random whim and exploration, I found quite a lot of bugs. Most of them already being reported by others, the search bar of the app however was showing inconsistencies

and was not reported. Keywords that were applied to restaurants were no use when searching using the search bar. The search bar would sometimes randomly bring up results that had no match with the letters provided. This being my first find, I was kind of excited. Though this find was completely random, I have learnt that there are several steps and rules to follow in order to find bugs and anomalies more quickly and efficiently. Some of the main steps being:

- First choose a particular feature of a sector on which you want to look for errors. An example can be the search box.
- Brainstorm possible normal path users would take or how they would use the feature in question.
- What can be irregular paths that a user might take or an irregular way a user might use that particular feature?
- How can you break the feature?
- Jot down all of these points and make note.
- Systematically rearrange all the ideas and possibilities.
- Finally execute in the testing environment accordingly:
 - Exploring a certain part of an app
 - Checking for anomalies in the admin panels
 - Run through Postman to see if we receive correct responses

3.2.2 Using Postman

Postman is a common API client that allows creating, sharing, testing, and documenting APIs simple for developers and testers. Users can make and store basic and complex HTTP/s requests, as well as read their responses. In order to start testing using Postman, I had to set up the environment. Since the Shohoz food app we were testing was at the beta stage, I had to create a new environment in Postman and named it Staging. I had to place the relevant parameters such the base URL and the access token to make the right environment. The very first thing I was made to test was whether the user app was getting proper response from the database and admin panel. A part of this test was to change a restaurant's opening and closing time from the admin panel, and then send a get request from postman using the relevant API. As it can be seen in Figure 3.2 below, the response received is expected. The API request that was sent was to initialize checkout sequence from cart. This cannot be done if the current time is not within the restaurant service hours. Hence the relevant response message. If the same request was sent during the service hours, then the response returned would remain empty as there would be nothing to report since it is possible to checkout while the restaurant is open.

Below is an example of a testing scenario:

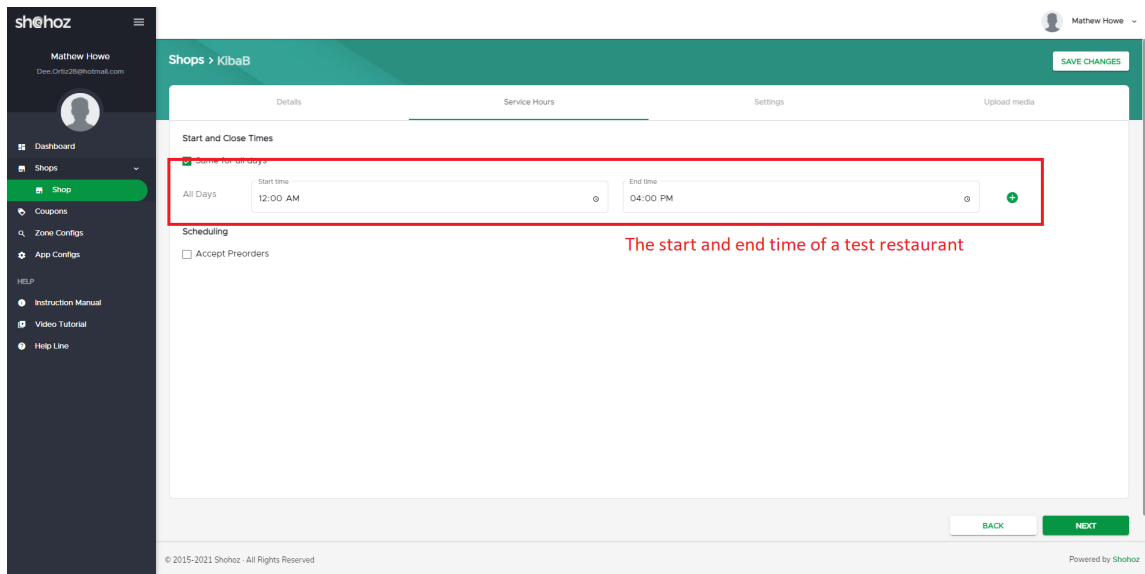


Figure 3.1: Admin panel to modify restaurant service hours

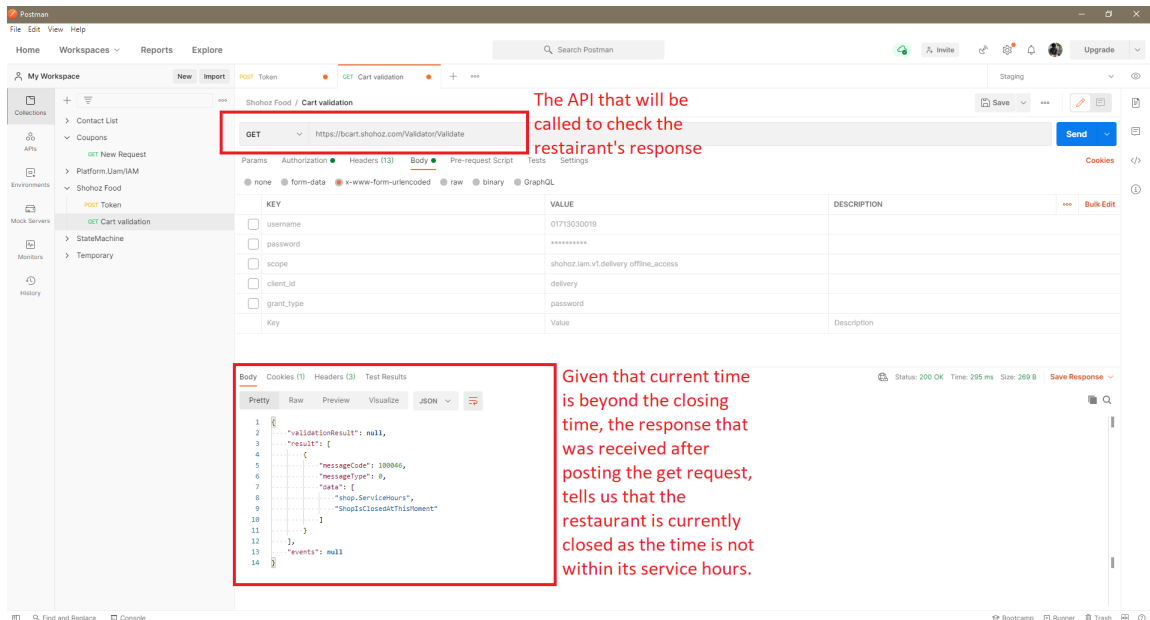


Figure 3.2: Postman API testing environment

3.2.3 First Case of Boundary-Value Analysis Testing

The method of checking between extreme ends or boundaries between partitions of input values is known as boundary testing. The previous case that has been explained is one example of boundary value analysis. I had to check time stamps of:

- Before opening time
- Exactly at opening time
- Right after opening time
- Mid-way through service hours
- Right before closing time
- Exactly on closing time
- Right after closing time

I had to record the responses in each case and had to ensure the response was a valid one. I was told to report to my supervisor if something unexpected happened. The reason why boundary value analysis was the right test here is because stakeholders want the restaurant to be open inclusive of the service hours. For example if the service hour is set to be from 12pm to 6pm. Then we would expect the restaurant to be open from exactly 12:00pm till 6:00pm. At 11:59am and at 6:01pm it would be closed. One anomaly I found was that the restaurant stayed open till 5:59pm, which in this case was not expected hence I had to report it and later the issue was fixed by the dev team.

3.2.4 Equivalence Partitioning Testing

Equivalence Partitioning, also known as Equivalence Class Partitioning, is a black box testing method that can be used at all stages of software development, including unit, integration, and device testing. Because of the limited number of test cases, this method divides input data units into equal partitions that can be used to derive test cases, reducing the amount of time available for processing.

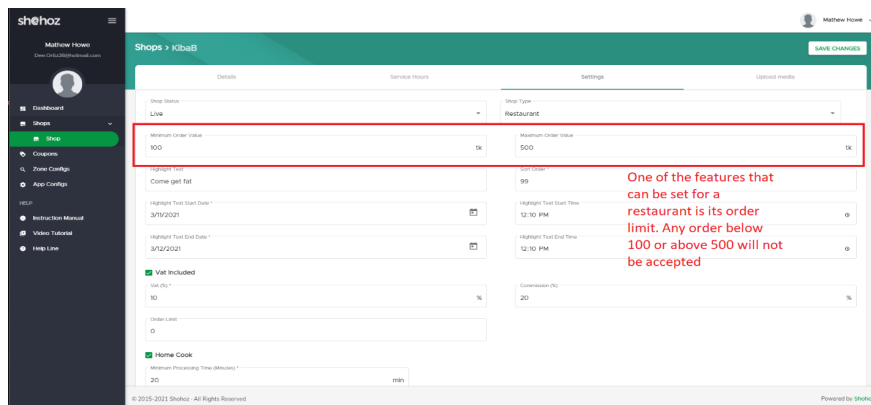


Figure 3.3: Order value limit

In Figure 3.3, a set amount of order value limit is set. Going below or beyond this limit will not allow the user to place an order. This is an example of equivalence partitioning testing. There are 3 possible test cases, and 2 possible outcomes. The test cases are below the limit, above the limit, within the limit. The outcomes are valid and invalid.

3.3 Tutorials and Assistance

My main source of help and learning was my supervisor who gave me plenty of time to explain things and show me how most of the work is done properly. Besides that I definitely had access to the internet so I also browsed several different websites to get a general idea. I also followed a book recommended by my supervisor, and I watched a couple of tutorials on Lynda.com.

3.4 Communication and Meetings

Working from home during the pandemic gave me a completely different experience as opposed to what I was expecting in reality. Our main mode of communication was Microsoft Teams. There were several different group chats according to the work needs. We also used Microsoft Outlook for work based emails. It was not as hard as I thought it would be to be able to communicate. Everyone was always online during the work hours (10am to 7pm) and in most cases also beyond that, so it was never hard to find someone if you needed help at whichever time. Every work day there are two compulsory meetings for everyone. One in the morning just to freshen up and to plan what will be the day's work. Anything new maybe discussed here and everyone in general is asked what will their responsibility will be for the day. The second meeting is right when the work hours end. This meeting is to make sure that everyone managed to finish their responsibilities and whether anything else is left out. If any work is left out, depending on its importance, either it is shifted to the next day, or people work a bit longer to finish it.

3.5 Work Environment

Working at Shohoz Limited has proved to be quite interesting and it has bene a great learning experience for me. I got to know a few new people, some of which I have become close with in a very short time. Everyone is extremely helpful, and no one puts down any ideas. I was not treated as an intern when I joined, rather a proper full time employee. That made it easier for me to transit into their work culture fast. Since everyone is working from home, most of the time, after the morning meeting, there are group chats where people are on call while they work just to keep an office environment alive. It is not necessary, however staying on call will make it easier to ask for help instead of calling someone separately again and again.

Chapter 4

My Introduction to Testing

4.1 How it started

Shohoz Limited has hired me to mainly focus on testing their food app. I have conducted simple testing from my day 1 at Shohoz. However, as time passed, the complexity of each feature that I had to test increased. Throughout the report I will explain with details on what feature I tested, how I progressed and what the outcome was.

4.2 Features, Bugs and their Fixes

In the oncoming chapters I will get into the full details of all the bugs I have found and the corresponding fixes that have been deployed to get them fixed. I will also explain the feature itself to give the reader a much clearer picture. I'll provide the user with test cases, and the steps as well where I have the liberty. When an issue or bug is found, it is reported on the Azure DevOps' sprint boards tagging the relevant developer who is working on that particular feature. Then that issue's link is forwarded to the developer in concern through Microsoft Teams' chat. As a tester, I must find issues and bugs and report them. When the developers start working on those errors, in most cases I am also called upon to join them in a debugging session. Explaining the bug/issue and brainstorming or suggesting possible solutions to the problem.

4.3 Creating My Own Testing Environment

After I was introduced with most of the basics, I had to set up my own restaurant and a few dummy accounts from which I can test the app and its general mechanisms. I created a dummy restaurant with different categories, sub categories, and items on the menu. My location for testing was Uttara, and I used a fake GPS app to conduct it as such. I was given two admin accounts to access the OMP and other admin features which I will also discuss in the future report.

4.3.1 Testing the Restaurant Panel

The restaurant panel itself had several bugs. Figure 4 is an example of a restaurant panel. In the right part of figure 4, you will notice something called customization. You can add further customizations to existing items on the menu, for example you can add an 'achaar' (pickle) with your 'kacchi' (a form of rice). This customization when updated was not showing up in the user app. The restaurant operating time could also be set in the wrong order (3pm to 1pm on the same day). These had to be spotted and reported to the dev team.

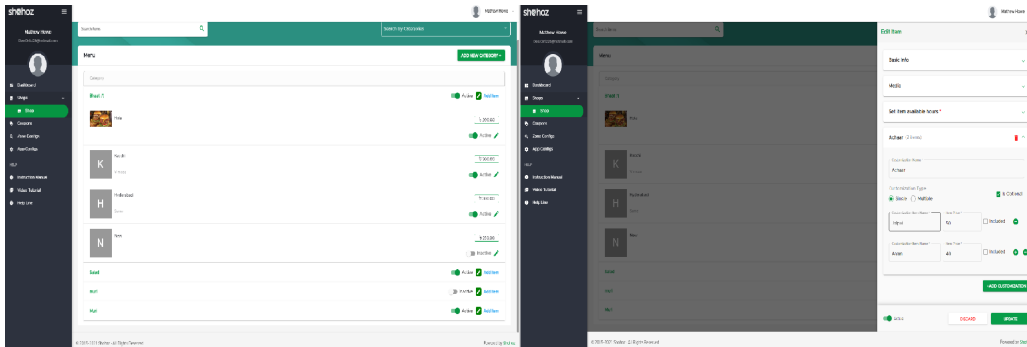


Figure 4.1: Restaurant Panel

4.3.2 Calculating Expenses

Orders placed have a large invoice. The price of the item itself, the tax imposed on it, supplementary duty, discounts (if applicable), and commission to Shohoz from the company. I was also given the responsibility to carefully scrutinize the price invoice and to make sure all the calculations were being done correctly by the algorithm responsible. Several things had to be taken into consideration. A single example can be a discount is shared between the restaurant and Shohoz percentage wise. Therefore, that also needs to be taken into account. There are generally three invoices produced. One for the customer, one for the restaurant, and one for Shohoz.

4.4 Order Placement

The first main feature I was assigned to was the post order placement feature. I had to ensure that once an order is placed, it is following the exact protocols as it should and is producing expected results. The stakeholders had set certain conditions that need to be present after an order has been placed, and that was on me to ensure that it did work properly.

4.4.1 Order in Order Management Panel (OMP)

The first part was pretty simple, I had to ensure whether the OMP received the order after it was placed by a customer. The OMP is like an admin panel where you can manage orders in various different ways. In future test, we will come across OMP a lot more in details. It might seem that the placement of order is something

quite simple, however, I had to try out several different cases of ordering for example ordering with:

- A different payment option
- Applying a coupon
- Card payment failing
- Order under or beyond the price range

4.4.2 Order Fraud Check

When an order is placed, depending on various conditions, it will be sent for verification which is called a ‘Fraud Check’. This check is done to ensure the order being placed is not a false or fake order as false or fake orders will be costly to the company. There are 2 main types of fraud checks; First Order Fraud Check, Regular Order Fraud Check. First order fraud check is self-explanatory, anyone who places an order for the first time paying with cash will have to undergo this verification process. Admins from Shohoz will verify accordingly from the OPM. Regular order fraud checks are conducted on certain amounts of price only for a fixed number of time and if the order is not paid with cash. Figure 5 will show all the requirements for a fraud check.

Payment Method	Customer Type	First Order	Order Number	Order Amount	Fraud Check
Card	-	-	-	-	No
Bkash	-	-	-	-	No
-	VIP	-	-	-	No
Cash	Regular	Yes		1 >500	First Order Fraud Check
Cash	Regular	Yes		1 <500	No
Cash	Regular	No		2 >1000	Yes
Cash	Regular	No		2 <1000	No
Cash	Regular	No		3 >1000	Yes
Cash	Regular	No		3 <1000	No

Figure 4.2: Fraud Check Table

Figure 4.2 is a chart I made to guide myself to conduct testing. I lined up test cases and made another table for that. Following that I noted down the outcomes and were checking whether the results were expected or not. I had to place orders from the beta app, and then from the OMP had to check whether the checks were coming in correctly or not.

4.4.3 The Provider App

The provider app, or also known as the delivery app is the app used by the Shohoz deliverymen (provider). It is also downloadable from Google Play Store or Apple App Store. Anyone can easily sign up or register with this app as long as they do not have the same number registered to a food app account. Initially the provider app has several inconsistencies and the responsibility was given to me to find all the issues and bugs present in them. Information of the order was not shown correctly,

the location of the restaurant was also incorrect, trying to update current state from the app would lead to an issue, all of this were spotted and I had to report every time I came across something like this. An example is when the provider picks up the food from the restaurant, he needs to swipe on the app to update his states. This state change was not recorded and did not show up on the OMP. Also very small things that can easily be overlooked had to be found. For example there is a time chart in the OMP keeping a track of the order. Every time the provider updates his status, the time chart updates as well, however there was a small error in time which was overlooked.

Chapter 5

Coupons

5.1 Coupon Testing

Coupon testing was by far one of the most complex testing I have done as an intern in Shohoz Limited. It has a vast number of features and logic behind it. It can be mixed and matched to give different results. It also includes complex calculations. Finally, it is the part which gives discount, hence reducing the amount of money that Shohoz earns, so if anything went wrong here, it would be a great financial loss for Shohoz as a whole.

5.2 Features of Coupons in Shohoz Food App

5.2.1 What exactly are coupons in the Shohoz App

Coupons in the Shohoz app works just like any other coupons in other apps. When applied, it gives a certain amount of discount to the user making a purchase from Shohoz's food app. There are 2 types of coupons that Shohoz provides, one is the 'attached coupon' and the other is the 'hand coupon'. An attached coupon is pre-attached by Shohoz admins to an item in the restaurant, or a category of food, or the entire restaurant itself. This coupon then acts according to the instructions set to it. A hand coupon is a coupon that is given to the users or customers. The coupon is shared with the users in form of a code. Right before checking out, if the user applies the coupon, the coupon will execute the instructions set to it. In simple terms, coupons are what gives users discounts on orders and encourage them to order more.

5.2.2 How does a coupon work?

A coupon is made efficient through a set of front end and back end commands. It has a large complex set of codes in the back end using C (due to confidentiality, the codes cannot be shared). In front end, the admin panel is used to set instructions on how exactly a code must work. Below is a screenshot of a part of the coupon admin panel. Here you can see the basic information about the coupon, for example its name, the coupon code (if any), how much discount it will provide, and what name it will be shown as on the user app.

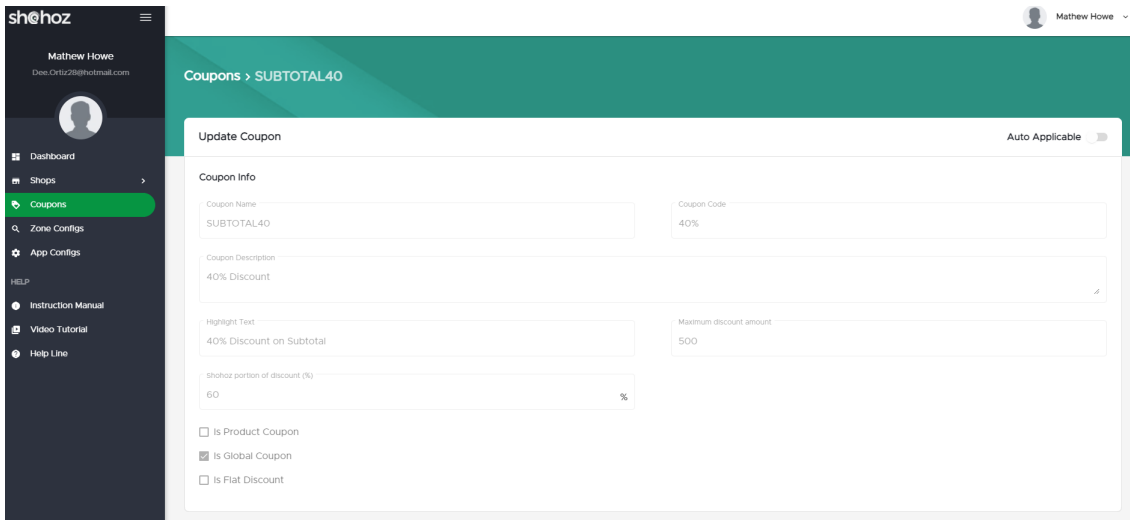


Figure 5.1: Coupon basic details

To clarify things, coupon name is unique to each coupon and cannot be repeated. Highlighted text is what is shown on the user app when this coupon is applied. Maximum discount amount is the limit on how much discount will be provided, this is usually useful when the discount is given as a percentage of the total order. Every discount is usually shared between the restaurant and Shohoz. Therefore, ‘Shohoz portion of discount’ is the percentage of the discount that Shohoz Limited bares. All of these need to be set before moving on to the next stage, that is setting how the coupon functions.

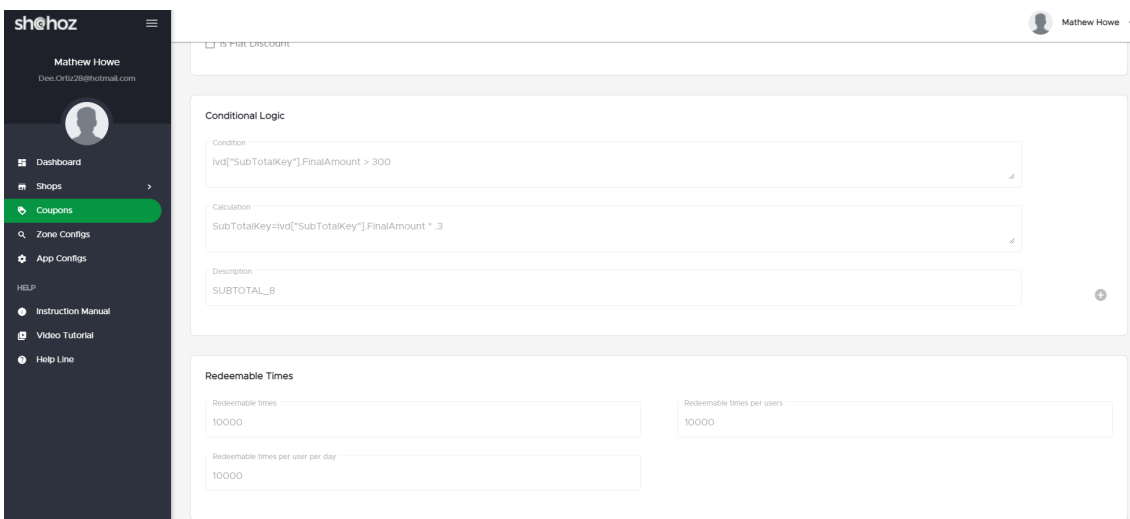


Figure 5.2: Coupon logic and settings

In the above diagram, conditional coupon logic is applied. Initially a condition is set. If the condition is met, only then the coupon will be applied. If a coupon does not need any conditions, and needs to be applicable at all times, then the condition can be set as ‘True’. The condition written in the picture above, “ivd["SubTotalKey"].FinalAmount >300”, means that if the subtotal amount of the food in the cart is above 300 taka, only then will the coupon be attached. The ‘ivd’ here stands for invoice data.

The line reads; if the subtotal amount in the invoice data is greater than Tk300, only then will the coupon be attached. The calculation box comes into play only when the coupon condition is met. Once it is met, the calculation is done accordingly and the discount is applied. From the figure above, “SubTotalKey=ivd [”SubTotalKey”].FinalAmount * .3” is the calculation that is done when the condition is met. This line of code reads; the subtotal amount in the invoice details will be subtracted by a value of [subtotal amount x 0.3]. This would ultimately give a discount of 30 percent on the subtotal amount. The description just acts as a small note given to the coupon. In most cases the coupon name is used for easy reference. The ‘Redeemable Times’ field is quite self-explanatory. No coupon is unlimited. Every coupon can be used by a user only a set number of times per day, and in total. Besides that, a coupon in general has a total useable time by everyone. The first field ‘Redeemable times’ denotes how many times that coupon can be used in total, does not matter which user uses it. ‘Redeemable times per users’ is the total number of times a user can use the coupon while it exists. ‘Redeemable times per user per day’ is the number of times a user can use a coupon in only 1 day.

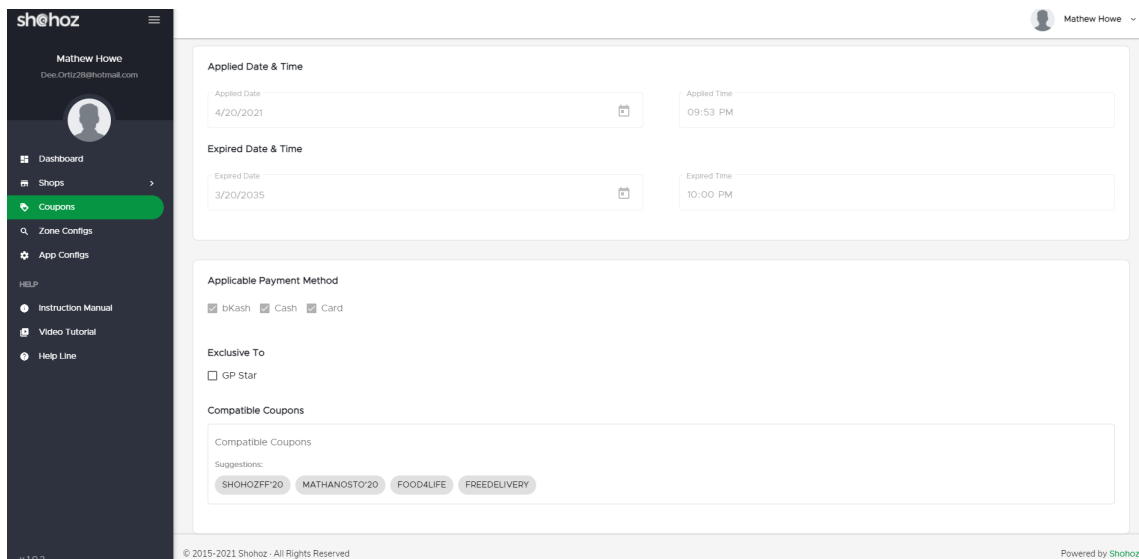


Figure 5.3: Coupon duration and compatibility

The above figure shows the final customization settings of a coupon. Here the duration of the coupon is set through dates and time. The payment method is also selected here as to ensure with which payment method this coupon is compatible with. It can also be exclusive to Grameenphone users. Lastly, the compatibility with other coupons can also be set through the last field. When all of this is set, the coupon ranking can also be determined and changed accordingly. A coupon ranking is set to make sure in an event of when several coupons are being applied on per order or one person, the discounts are placed in the correct order depending on the ranking (higher ranking first).

5.2.3 Examples of Coupons

To make the scene a bit more clear, examples of coupons will be shown below. Note: All the coupons that will be shown below are test coupons and not original func-

tional coupons. However, they do mimic most original coupons.

Example 1 –

Coupon type: Hand coupon.

Coupon application: Subtotal amount discount

Coupon code: 'subtotal40'

Condition: 'ivd ["SubTotalKey"].FinalAmount >300'

Calculation: 'SubTotalKey=ivd ["SubTotalKey"].FinalAmount * .4'

Description: During checkout, when the code is applied, the user will get a discount of 40percent on the subtotal amount

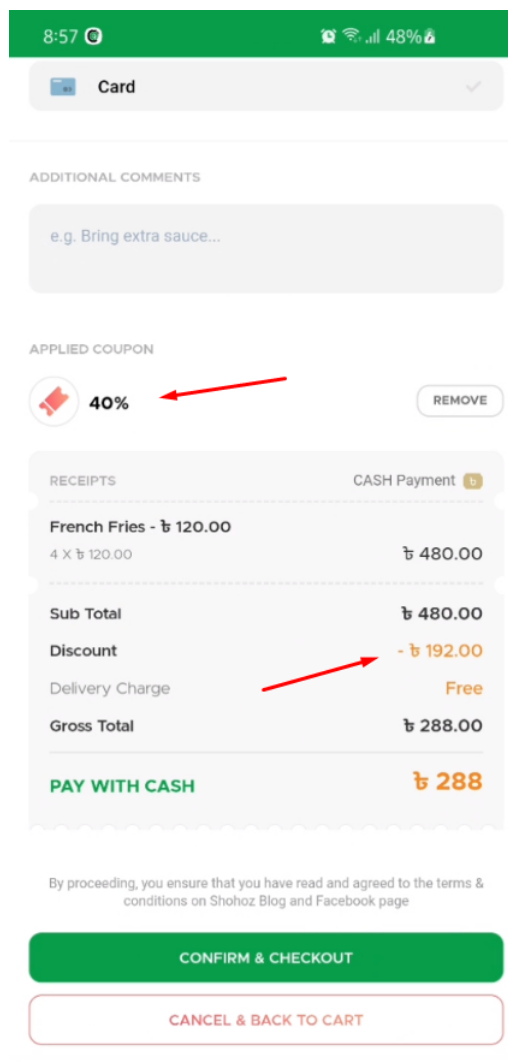


Figure 5.4: User app checkout page with discount coupon applied

Example 2 –

Coupon type: Attached coupon.

Coupon application: Product price discount

Coupon code: N/A

Condition: 'true'

Calculation: 'product.ActualAmount * .4'

Description: This coupon is a product based coupon that adds a discount based on

the price of an individual item. This coupon is pre attached by Shohoz admins from the admin panel. Users will be get the discount whenever they add the product to their cart. The users will get a discount of 40 percent on each item the coupon is pre-attached to.

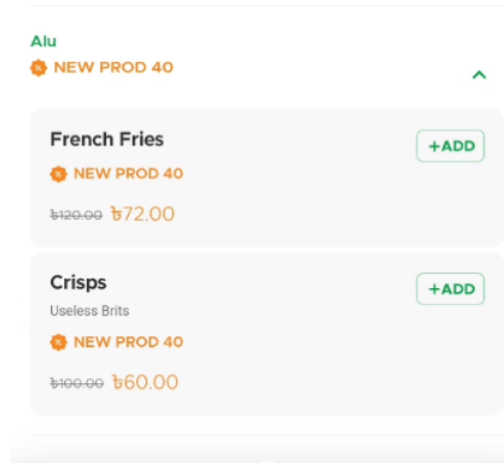


Figure 5.5: Highlighted text is seen on top of the items and the relevant discounts are shown

Example 3 –

Coupon type: Hand coupon.

Coupon application: 50 percent delivery off

Coupon code: DCSL

Condition: ‘adc[”PlacedOrders”].LongValue >1 AND adc[”PlacedOrders”].LongValue <5’

Calculation: ‘DeliveryChargeKey=ivd[”DeliveryChargeKey”].FinalAmount * .5’

Description: There are some coupons that require dual conditions. This is such an example. Here ‘adc’ stands for Additional Data Context. This condition dictates that the user must have already placed 1 order before, and will be able to avail the discount up until he has placed 5 orders in total. If this condition is met, then 50 percent discount will be provided on the full delivery charge.

5.3 Steps and Cases to Test the Coupons

As a tester I have to ensure that all the functions and features of a particular area works flawlessly. Besides that, I also have to find out whether there are any underlying bugs to be found.

5.3.1 Coupon Application and Calculation Test

The very first test conducted for coupons was the application test. It was a pretty simple test where it was ensured that the coupon is applied properly in each case. It had to be ensured that attached coupons were correctly applied in each case to the restaurant, item category, and the item itself. Then through the user app I could

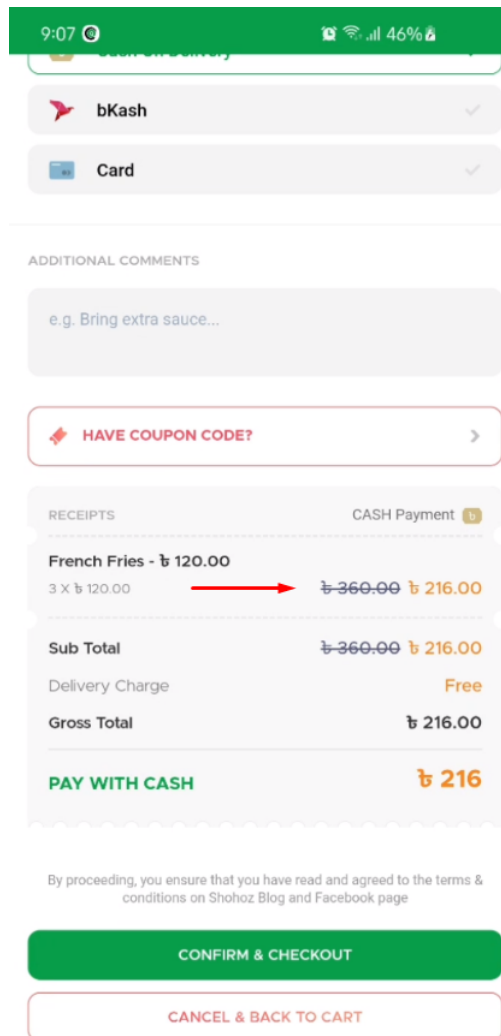


Figure 5.6: You can see the relevant discounts added to the invoice after being added to the cart

check whether the discount was applied accordingly or not.

- There were about 20 different cases to test in just the application of coupons. A few cases are given below:
- Simply apply an attached coupon and proceed with the order
- Simply apply a hand coupon and proceed with the order
- Apply an attached coupon without meeting the coupon's logical requirement and proceed with the order
- Apply an attached coupon with meeting the coupon's logical requirement and proceed with the order
- Apply an attached coupon to the restaurant, apply a different attached coupon to an item of the same restaurant, and then order that particular item to check whether the coupons provide a discount properly based on the compatibility of each other and also according to the ranking of the two coupons.
- Apply an attached coupon to the restaurant and then apply a hand coupon at checkout.

The above mention cases each then further branches out to even more sub cases which are tested in order to ensure that all the logic is applied correctly and that there are no underlying bugs. The next thing I had to check was whether the calculations were done correctly or not. There are a lot of logic involved behind each discount and it had to be checked quite critically. Being a financial side of the app, two of us were assigned to test this part.

5.3.2 Coupon Status during Order Migration

This was a very complicated and time consuming test. There were several debugging session that had to be attended with the devs in order to get everything running in perfect order. Before explaining the test cases, the reader must understand what an order migration is. When a user places an order, the user might change their mind and may want to make some changes to their order. They may add or remove items from the order. When they wish to do such, they must contact a Shohoz admin, and the admin will bring about the changes from the Order Management Portal (OMP). When the changes are made to an order, 'migration' takes place, meaning the old order is dropped, and a new order is formed with all the updates the customer wanted. While this was a simple task, the codes that dictated how coupons would work faced issues. Hence came the following tests.

When an order is placed with a coupon, the user gets the appropriate discount. However if the user wishes to make any changes to the order, the coupon would not migrate along with the order. However, once this bug was spotted, I reported it and it was an easy fix. The next test was similar, but with lots of conditions.

Let's break it down:

Coupon condition: order total must be greater than Tk300

Coupon count: each user can use the coupon and enjoy the discount only once

Now initially the user ordered food worth more than Tk300 and also it was being used for the first time. However, after placing the order, the user decides to change their mind, and now the new migrated order is below Tk300. The coupon is still applied; this is a problem, and was duly fixed. With the same exact case next time, when the migration was complete, the discount was not given any more as the first condition was not met. Which worked out fine. However the user did not get to enjoy the coupon even once, hence by logic they should be able to apply it again next time when they chose to. That did not happen, the database has already counted the coupon as used, even though it was not used after the migration. This fix required quite a lot of hours as there were some major changes in the code of the coupon department to make get the logic to work out properly.

Chapter 6

Order Management Portal (OMP)

6.1 What is the OMP

The Order Management Portal or the OMP is a crucial part of the entire Shohoz Food venture. All the orders and delivery men (providers) are controlled through here. Orders being added, cancelled, changed, transferred, placing a complaint, assigning someone to take care of it, and so on, all these tasks are completed here. The OMP also segments and separates orders based on their state (order placed, order delivered, etc.). Orders can also be individually searched up using the search bar and filters provided. Restaurant details can also be accessed for any given reason. If a new admin joins Shohoz and is given the responsibility to handle the OMP, they will receive an instruction manual and also a video tutorial if required.

Logging into the OMP with different accounts will give each different privileges. Shohoz admins have the highest privileges, then there are Restaurant Admins and Executives. Each of these have different privileges with different tasks. When testing, we test mainly as Shohoz admin, however when specific features need to be tested, we login through the other accounts.

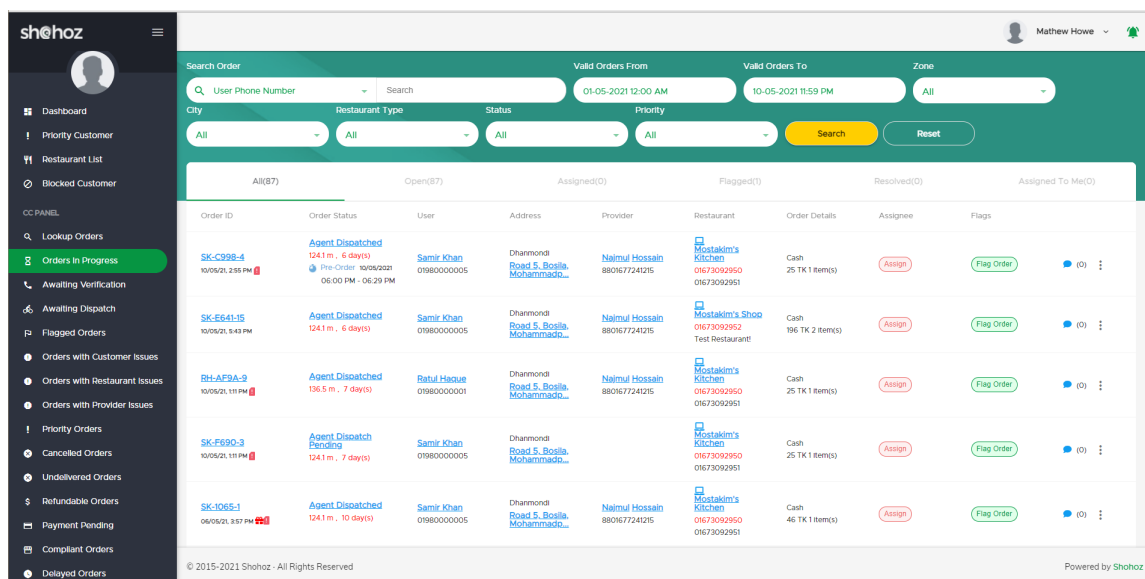


Figure 6.1: The Order Management Portal

6.2 Important Features of the OMP

The OMP has a vast number of features. Different people were assigned to test different sections. I will expand upon the features that I was assigned to only. There were several features, some very minute but critical, whereas some quite large and complex.

6.2.1 Placement of Orders

Orders that are placed each have a uniqueness to it. It can be a simple order, it can be a pre order, an order can change its state (i.e. food being prepared, ready for delivery, delivered, etc.), it can have payment pending, etc. The first task given to me was quite simple but monotonous. I had to ensure that each of the orders were placed in the correct panel in the OMP. Orders that were cancel must be found in the ‘Cancelled Orders’ panel, orders that have payment pending must be found in the ‘Payment Pending’ portal and so on. An Excel file was provided to me for cross checking what was needed where. So simply put, I had to place dummy orders, with each criteria being met, changing the states of the orders accordingly from the OMP and cross checking with the Excel file.

**The google drive link to the reference files is attached below in the bibliography [5]*

6.2.2 OMP Bucket Count and Auto Updating Statistics

Every panel in the OMP has certain tabs and buckets. Each tab and bucket carries specific information about an order. When admins are completing certain task while on the OMP, it may need to reload and refresh in order to update the OMP on the current statuses of each order. These updates were not consistent and showed irregularities. In this case, since the issue was already known, what had to be done was to find out exactly what caused the issue. Without the cause of the issue, it could not be fixed as it seemed that the issues were happening at some random order. As small as it may seem, wrong statues of the orders, and incorrect bucket counts can lead to misunderstanding and miscommunication between the customer and the admins which may prove to be fatal for Shohoz Food. Below is a screenshot to clarify a part of the OMP for better understanding.

Order ID	Order Status	User	Address	Provider	Restaurant	Order Details	Assignee	Flags
K2-2D2D-28 17/06/21 123 AM	Agent Dispatched 17 km - 12 hours(S)	Kasim 22 01234567899	Mohammadpur/Kolya Mohammedpur, Dh 1202	Naimul Hossain 880167724215	KibaB 01787855662 01787855662	Card 150 TK 1 items	Assign	Flag Order
K2-A27B-27 17/06/21 106 AM	Agent Dispatched 17 km - 13 hours(S)	Kasim 22 01234567899	Mohammadpur/Kolya Mohammedpur, Dh 1202	Naimul Hossain 880167724215	KibaB 01787855662 01787855662	Card 150 TK 1 items	Assign	Flag Order

Figure 6.2: Some Features of the OMP

1. A ‘bucket’ houses more sub categories of orders in a more customized format. Each bucket has a count of how many orders are currently present under them (auto updates with new changes).

2. Tabs/headers of the following information below them (remains static).
3. Order IDs that only change if an order has been migrated to a new one (see chapter 5.3.2).
4. Current order status. This changes simultaneously with the actual status of the order (auto updates with new changes).
5. Delivery address, this remains static throughout.

Chapter 7

The Shohoz Food App

Shohoz Food app, or the user app is the main gateway to receive the services provided by Shohoz Limited. One of the main features this app provides is their food delivery. The app is where the users/customers will directly interact with Shohoz, hence it is crucial for this part of the app to be completely flawless as once a customer is unsatisfied with the experience, then they won't come back for a second time. Therefore, it must be absolutely flawless and bug free.

7.1 How Does Shohoz Food App Work?

The user app for food consists of a list of restaurants you can order from, and once you enter a restaurant its menu will show up and you can choose the food of your choice. You have options to pay with cash, card and Bkash. You can also pre-order food to be delivered at a later time. You can directly search for a specific restaurant through the search bar, and if you cannot make up your mind, then the featured restaurants will be available on top and you can order from any one of those.

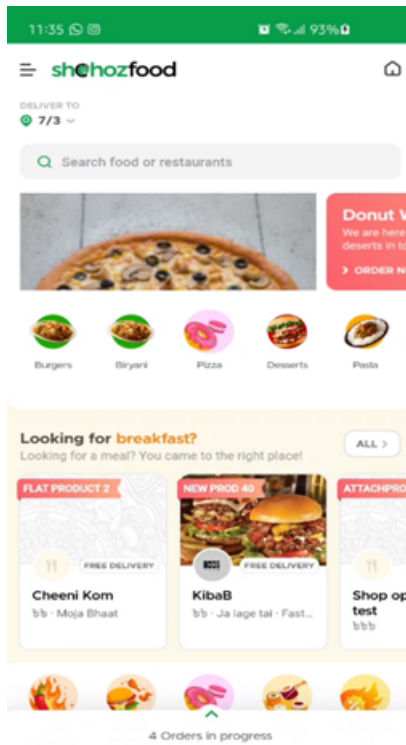


Figure 7.1: Shohoz Food App Homepage

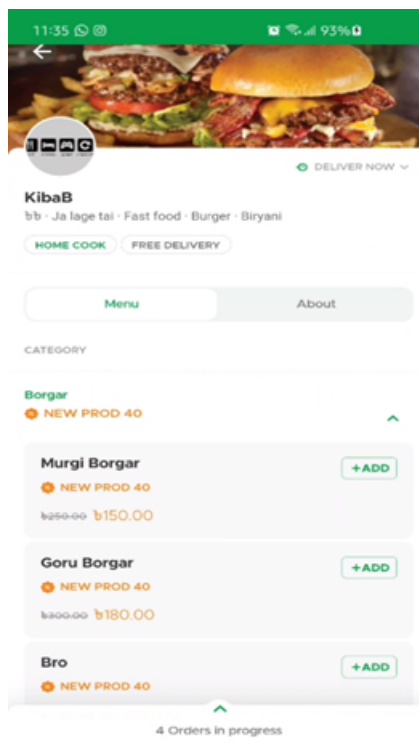


Figure 7.2: Shohoz Food App Restaurant Menu

7.2 Things to look around in the Food App

The food app is essential for Shohoz's food venture. Therefore making sure the app ran smoothly was of the utmost importance. The area that had the most issues were the synchronization between the app and the database. When this task was assigned to me, a new update was just deployed, hence I had to conduct regression and grey box tests to find new bugs.

The goal of regression testing is to verify that software changes, such as adding new features or changing existing ones, do not have a detrimental effect on software features that should not change. Regression testing is generally done by executing some or all of the test cases that were designed to test changes in prior software versions [1].

7.3 Incorrect Order Status Updates on User App Due to Desynchronization

Every time an order is placed, the user is kept updated of its state through the user app. At the bottom of the app there is a small tool tip that shows you the real time progress of the customer's order.

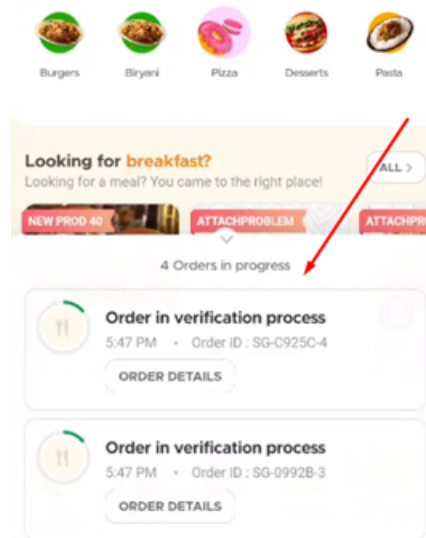


Figure 7.3: Order Status Tool tip

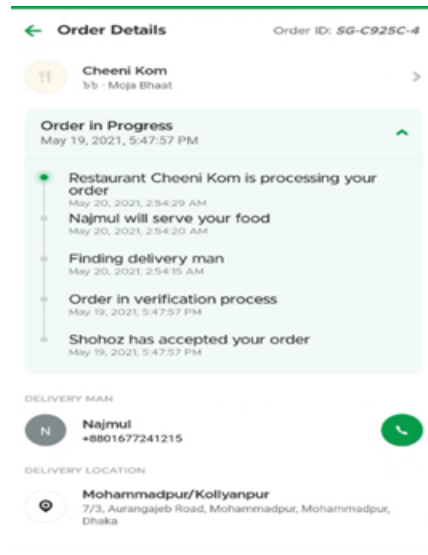


Figure 7.4: Order Details Page

That feature did not work at very specific times. Reproducing that error was crucial as it was not happening always. Therefore to make it easy, I made an excel sheet with all the possible cases and then cross checked them all one by one. It was a lengthy process but at the same time very efficient. Below is a screenshot of a part of the entire test case and I have also attached the excel file for reference.

Complaint step	Delivery by step	State change to	Expected abnormality in	Order Details	My Orders
FALSE	FALSE	Order	Progress bar shows up "Finding delivery man"	New update "Finding delivery man"	Progress bar shows up "Finding delivery man"
		agent dispatch pending	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		agent dispatch pending to agent dispatched	Increase in progress bar "Restaurant abc is processing your order"	New order state update "Restaurant abc is processing your order"	Increase in progress bar "Restaurant abc is processing your order"
		agent dispatched to placed order	No change	No change	No change
		placed order to migration initiated	No change	No change	No change
		migration initiated to migration cancelled	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		placed order to picked up order	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		picked up to delivered	Progress bar fills up and is removed	Updated to delivered	Progress bar fills up and is moved down to completed orders list labelled delivered
FALSE	FALSE	Order	Progress bar shows up "Finding delivery man"	New update "Finding delivery man"	Progress bar shows up "Finding delivery man"
		agent dispatch pending	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		agent dispatch pending to agent dispatched	Increase in progress bar "Restaurant abc is processing your order"	New order state update "Restaurant abc is processing your order"	Increase in progress bar "Restaurant abc is processing your order"
		agent dispatched to cancelled	Progress bar is removed	Updated to cancelled	Progress is removed and is moved down to completed orders list labelled cancelled
FALSE	FALSE	Order	Progress bar shows up "Finding delivery man"	New update "Finding delivery man"	Progress bar shows up "Finding delivery man"
		agent dispatch pending	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		agent dispatch pending to agent dispatched	Increase in progress bar "Restaurant abc is processing your order"	New order state update "Restaurant abc is processing your order"	Increase in progress bar "Restaurant abc is processing your order"
		agent dispatched to placed order	No change	No change	No change
		placed order to migration initiated	No change	No change	No change
		migration initiated to migration complete	changes to a new order number and shows "I will serve your food"	updates to a new order number and shows "I will serve your food"	changes to a new order number and shows "I will serve your food"
		agent dispatched to placed order	progress bar back to "Restaurant abc is processing your order"	New order state update "Restaurant abc is processing your order"	Increase in progress bar "Restaurant abc is processing your order"
		placed order to picked up order	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		picked up to delivered	Progress bar fills up and is removed	Updated to delivered	Progress bar fills up and is moved down to completed orders list labelled delivered
FALSE	FALSE	Order	Progress bar shows up "Finding delivery man"	New update "Finding delivery man"	Progress bar shows up "Finding delivery man"
		agent dispatch pending	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		agent dispatch pending to agent dispatched	Increase in progress bar "Restaurant abc is processing your order"	New order state update "Restaurant abc is processing your order"	Increase in progress bar "Restaurant abc is processing your order"
		agent dispatched to placed order	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		Provider reassigned	change in progress bar "I will serve your food"	No change	No change
		Provider reassigned back to old provider	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		placed order to picked up order	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		picked up to delivered	Progress bar fills up and is removed	Updated to delivered	Progress bar fills up and is moved down to completed orders list labelled delivered
TRUE	FALSE	Order	Progress bar shows up "Finding delivery man"	New update "Finding delivery man"	Progress bar shows up "Finding delivery man"
		agent dispatch pending	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		agent dispatch pending to agent dispatched	Increase in progress bar "Restaurant abc is processing your order"	New order state update "Restaurant abc is processing your order"	Increase in progress bar "Restaurant abc is processing your order"
		agent dispatched to placed order	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		placed order to handled over	"Need to confirm"	No change	"Need to confirm"
		handled over to picked up	Increase in progress bar "I will serve your food"	New order state update "I will serve your food"	Increase in progress bar "I will serve your food"
		picked up to delivered	Progress bar fills up and is removed	Updated to delivered	Progress bar fills up and is moved down to completed orders list labelled delivered

Figure 7.5: Cases for Real Time Order Status Update on the User App

The above screenshot and attachment shows all the results of the test, due to confidentiality, I was not allowed to share the expected results.

Besides orders not being synced, sometimes restaurant updates were also not synced. Whenever a new item was added to the menu of a restaurant, the particular item would not show up if the item had add-ons. Another issue was no restaurant items would show up at all when new deployments had been passed and the fix was to 'blank update' all the restaurants with the items on the menu. While some of

these issues were known and I only had to carry out a regression test, most were unknown, especially with the real time updates which were reported and later fixed at a debugging session with the developers.

Chapter 8

Pre Order

The pre order feature was added near the end of the 4th month of internship at Shohoz Limited. This feature came suddenly and was the first of its kind in the app. Hence it started off with quite a lot of bugs and issues. The feature itself is quite self-explanatory. You select a later time at which you would like your food to be delivered. This option can also be selected if a restaurant is closed, so you can order food when the restaurant is closed and receive it as soon as they are up for service. There are quite a lot of logic at work here. They will all be explain in the following chapters.

8.1 Pre Order User App Tool tip View and Menu

An item can be pre ordered for the current day from 1 hour after current time till 11:59pm and also for the whole of next day till 11:59pm. Each pre order slot is fixed. It will start at a whole number, and end in 29 minutes interval. For example, (2:00 to 2:29) or (2:30 to 2:59). A user can select the day and timing accordingly and place their order. This also depends on whether the restaurant accepts pre orders or not and at what time they accept the pre orders.

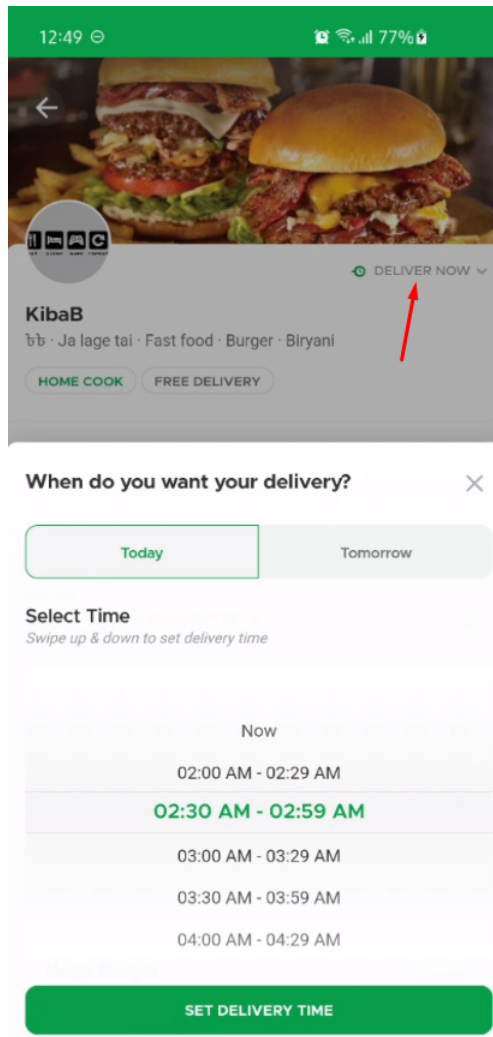


Figure 8.1: Pre order menu and tool tip

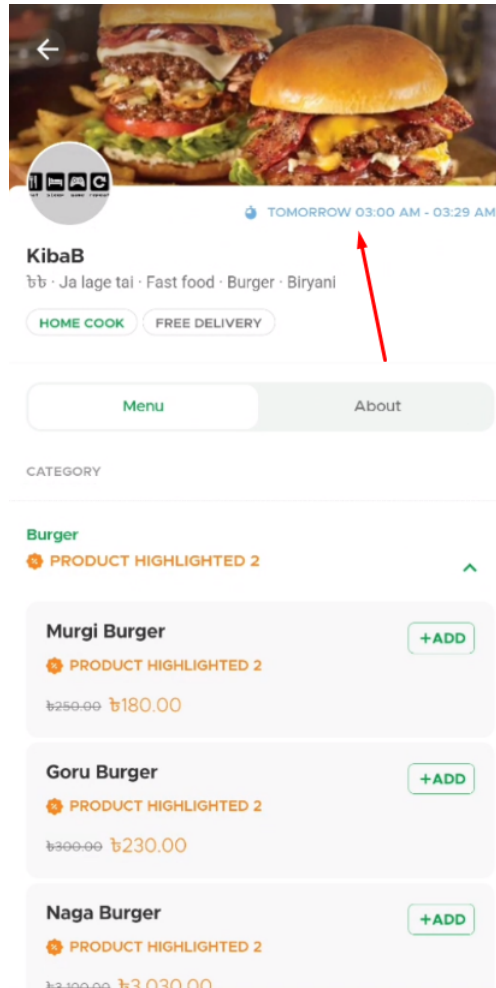


Figure 8.2: Tool tip after a pre order time has been selected

8.1.1 Tool tip According To Different Restaurants

Pre order time options will work according to what the restaurants have available. Some restaurants may have pre order options open for however long their restaurant is open. Some restaurants may choose to offer pre order only at certain times. These settings can be changed from the Shohoz restaurant admin panel.

In figure 8.3, you will be able to see that the restaurant is open for 24 hours every day. However, the pre order timing is different than their running time. Therefore if a pre order time is selected that is outside of the scheduled hours, then the items on the menu will show unavailable. An example of this is shown in figure 8.4.

Start and Close Times

Same for all days

All Days 12:00 AM 11:59 PM

Scheduling

Accept Preorders

Allow Preorder for

Today Tomorrow

Scheduled Hours

Same as starting and closing times

Same for all days

All Days 02:00 AM 06:00 AM

05:00 PM 08:00 PM

Figure 8.3: Admin panel to edit ‘Scheduled Hours’; which sets the pre order time accordingly

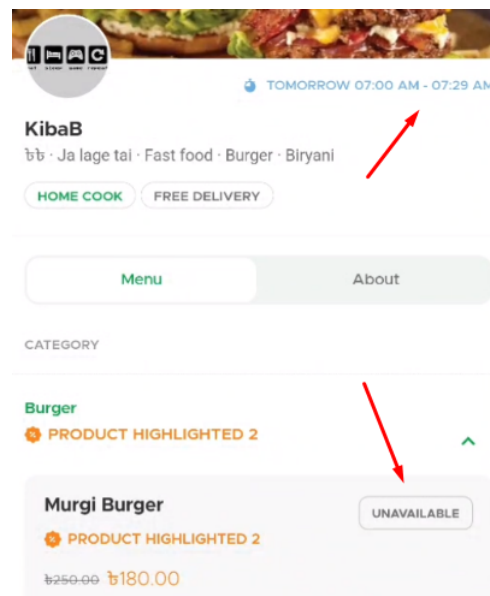


Figure 8.4: Item is unavailable as the pre order time selected is not in-between the scheduled hours

8.1.2 Tool tip Issues and Bugs

Just like most new features introduced to the app, the pre order feature also had several bugs when deployed to the beta environment for testing. The biggest issue was the menu items were not syncing with the pre order time. These issues were not known. I was given the responsibility to conduct grey-box testing in this case and to ensure that there is no issue with pre order timing and menu item selection. However, several issues were found during my testing. Before I started, I had to make several different test cases and had to run a regression test to see if everything worked fine if progressed through a positive path. A few examples of my first regression test run is given below in figure 8.5.

For same for all days:		
1. only one slot: 6:30pm - 8:29pm	a. is the item available at 6:30? NO	(YES)
	b. is the item available at 8:30? YES	(NO)
2. only one slot: 6:30pm - 8:30pm	a. is the item available at 6:30? NO	(YES)
	b. is the item available at 9? NO	(NO)
	c. is the item available at 9?	
3. dual slot : 5:30pm - 7:30pm; 9:30pm - 10:30pm	a. is the item available at 5:30? NO	(YES)
	b. is the item available at 7:30? YES	(YES)
	c. is the item available at 8? NO	(NO)
	d. is the item available at 9:30? NO	(YES)
	e. is the item available at 10:30? YES	(YES)
	f. is the item available at 11? NO	(NO)
4. dual slot : 5:30pm - 7:29pm; 9:30pm - 10:29pm	a. is the item available at 5:30? NO	(YES)
	b. is the item available at 7:30? YES	(NO)
	c. is the item available at 9:30? NO	(YES)
	d. is the item available at 10:30? YES	(NO)

Figure 8.5: Regression test for positive path of pre order time selection and menu item availability (expected results in the brackets)

Making test cases are essential to testing, this ensures that I don't make any repetitions or I don't miss out any cases. A few of them has been shown below in figure 8.5.

Description	Case (timing)	Observation
Several slots in a single day	2pm-3pm and 5pm-6pm	3pm-5pm is closed, yet you'll see pre order time slots available when ordering. However, orders cannot be places in between these times even though you'll be allowed to select it
Scheduled hours runs slightly into the next time slot	2pm-4pm	You will notice that the time slot for 4pm-4:29pm is also up for selection and orders will be accepted during this time
Several time slots in a single day	4pm-6pm and 8pm-9:59pm	Users can choose slots 1 hour from the starting scheduled time. This is followed in the first instance of the slot. However, during the second scheduled time, users can place orders instantly from the starting time

Figure 8.6: A few of my test cases before conducting full scale testing

Following the above cases and more, I have discovered several discrepancies. The biggest issue was when the menu items were available even when the restaurants were not providing pre order. This issue was seen when there was a gap in-between

pre order serving hours. The second issue found was, menu items were still available into the next slot of the last pre order serving time. For example, if the service hour ends at 9:15 (slot ends at 9:29), menu item is available in the next slot as well (9:30 to 9:59 slot). These were 2 of the many issues that was reported. In order to fix these, there were debugging sessions were I had to sit with a member of the development team and bring about small changes to the code and discuss solutions with them until a fix was found. Once a fix was found, the new patch was deployed into the beta environment and was retested to see whether everything worked fine. Once that was cleared, the new fix was then deployed into the production environment.

**The google drive link to the reference files is attached below in the bibliography [5]*

Chapter 9

Restaurant Opening and Customization Menu

9.1 Restaurant Open Criteria

For a restaurant to be ‘open’, it will need to meet a few criteria besides opening and closing time. A few examples may be the zone (Gulshan-2, Mohammadpur, ETC.) the restaurant is in and whether that particular zone itself is active or not. A subzone is another area inside the main zone, for example Iqbal Road is a subzone of Mohammadpur. If subzones are closed, then the shop will not appear in that specific subzone only.

9.1.1 Restaurant Timing

Restaurant opening and closing times need to be perfect. In a day and age as competitive as now, every minute can mean the loss or gain of customers. Therefore if a restaurant wanted to be open at 5pm sharp, Shohoz Food would have to ensure that the restaurant would be available to the customers at 5pm sharp. If a restaurant wants to close at 2am, then the app must comply. Leaving the shop open after closing hours mean a customer can place an order to a restaurant that’s closed and that can cause complications for both the restaurant and the customers.

In the diagram below you will be able to see the descriptions and validations in more detail.

Criteria	Description	Validation	Effect
Restaurant service hours	A restaurant will only appear 'open' when a user views it in between the service hours. Otherwise it will appear 'closed'	Setting a restaurant service hour (2:00pm - 3:00pm) Current time: 2:45pm	Restaurant will appear open
Zone	The zone itself matters as to where the restaurant is located and how far the user is from the restaurant	Needs to be checked in reference to other criterias	
Sub Zone	To further restrict the are of service by a restaurant, it can choose to serve users within a particular sub zone only(generally a smaller area), which is part of a parent zone itself	A restaurant is set in subzone A1 and the user is in the same zone but in a different subzone of A2	Restaurant will not appear to the user at all
Look up radius	This radius is set when configuring individual zones. If the restaurant and the user falls under the look up radius of the zone the restaurant is in, then the restaurant will show	A restaurant is set in a zone with a fixed look up radius, and the user is ordering from a range much further than the radius	Restaurant will not appear to the user at all
User's Access to Restaurant	This can be blocked or unblocked. User access to restaurants can be blocked completely for a certain amount of time. If the access of zone A's users is blocked, then they will not be able to order from any restaurant anywhere. In this case the users will get a notice upon entering the app as well as will not be able to checkout from their cart	Zone A's users' access is blocked	All users from zone A will not be able to order anything from any restaurant at all
Restaurants access block	This can be blocked or unblocked. While blocked, the restaurants in the particular zone will not be able to receive any orders from users. In this case restaurants of that zone will appear closed	Zone A's restaurants are all blocked	Users from any zone will not be able to order from zone A. They will be able to order from any other available zones
Zone opening and closing times	Any restaurant in a particular zone will only appear open inbetween the zone active hours. Any other time and it will appear closed	Setting zone service hour (2:00pm - 3:00pm) Current time: 2:45pm	Restaurants in the zone will appear open
Exclude Zone	Look up radius of zones usually overlap at times. In this case, restaurants can serve users of zone B from zone A. To prevent this, certain zones can be excluded so that service is only provided in the desired zones	Exclude zone B. User in zone A. Zone A's radius overlaps zone B and C.	User can only order from zone A and zone C but not zone B

Figure 9.1: Criteria for restaurants to be shown on the app or be 'Open'

9.2 Customization Menu

When you select an item from the menu, many of them have customization options. For example if you select a sub sandwich for purchase, you may have the option to add extra meat or extra sauce, or order extra add-ons. Some options are compulsory (mainly free as well), for example the level of spiciness in a sandwich. Some options may be optional (may or may not be free), for example extra sauce to be added with the sandwich. Some options can be added once, a limited number of times, or an unlimited number of times. All of these are customization options of a single item on the menu varying from restaurant to restaurant, item to item.

9.2.1 A specific category to 'others'

In the Shohoz food app, it has been divided into 4 different categories; 'Add-ons', 'variation', 'choices' and 'others'. These are more commonly known as customization tags. When creating a menu and adding items, these customizations tags are set by the relevant admins. The first three categories are very specific and have specific conditions, however, the 'others' category is placed when it is a mix and match of the other 3 categories.

Customization Tag	Expected Auto-Fill	Number of item to select	Minimum Selectable	Exact Selectable	Max item count	Is optional	Is Included	Pass/Fail	Remarks
Addons	Multiple	Maximum	0	0	1000	TRUE	FALSE	Pass	
Variations	Single	-	0	0	0	FALSE	FALSE	Pass	
Choices	Multiple	Maximum	-	user input	-	FALSE	TRUE	pass	

Figure 9.2: The 3 main customization criteria

Whenever any changes is made to either one of the criteria in the above categories, their tag is immediately changed to the 'Others' tag.

9.2.2 ‘Others’ to a specific category

Sometimes, when the criteria is changed to one that matches with either one of the categories, they should automatically change back to the respective categories (this did not happen before). This had to be ensured strictly as it was an important setup for the restaurant admins.

Initial Setup							Add-ons		
customization tag	Customization type	IsOptional	Number of item to select	Exact value	Max value	Minimum value	Next steps	Expected	Pass/Fail
Others	multiple	FALSE	maximum		100		Set Customization tag = add-ons	Customization type becomes multiple, number of item select changes to Maximum, item count changes to 1000, is optional becomes TRUE	pass
Others	single	FALSE	-	-	-	-	Set Customization tag = add-ons	Customization type becomes multiple, number of item select changes to Maximum, item count changes to 1000, is optional becomes TRUE	pass
Others	multiple	TRUE	maximum	-	100	-	Set Customization tag = add-ons	everything should remain the same and max item count should be changed to 1000	pass
Others	multiple	FALSE	minimum	-	-	100	Set Customization tag = add-ons	Customization type becomes multiple, number of item select changes to Maximum, item count changes to 1000, is optional becomes TRUE	pass
Others	multiple	FALSE	exact	2	-	-	Set Customization tag = add-ons	Customization type becomes multiple, number of item select changes to Maximum, item count changes to 1000, is optional becomes TRUE	pass
Others	multiple	FALSE	range	-	10	100	Set Customization tag = add-ons	Customization type becomes multiple, number of item select changes to Maximum, item count changes to 1000, is optional becomes TRUE	pass

Figure 9.3: ‘Others’ to add-ons test cases

**The google drive link to the reference files is attached below in the bibliography [5]*

Chapter 10

War Rooms, Dry Runs and Automation

10.1 War Rooms

A war room is a centralized meeting location where project teams members, leaders and stakeholders gather to convey project operations graphically. The purpose of a war room is to bring the complete team together in one place to improve communication, problem-solving, risk minimization, and status reporting. Depending on the nature of the project and current world situation, the meeting site might be physical, virtual, or even a mixture of both [2].

Given that the world is undergoing a pandemic, Shohoz Limited hosted all of its war rooms since I joined online. What is discussed in the war rooms are strictly confidential hence I am not at the liberty to share the details. However, I am allowed to share a few facts that goes on in the war rooms of Shohoz Food. Since it is held online, the developers and QA team leaders take turns sharing their screens and discuss about the issue at hand or debate on better and more feasible solutions. Other members that are present are also encouraged to share their opinions and in most cases are asked to share those in respect to what they worked on. It is a very friendly environment and while everyone is seriously doing their tasks and discussing, at the same time light jokes are being cracked and small anecdotes are shared to lighten up the mood and helps the mood to not get too monotonous.

Conducting war rooms are essential before any deployment into the production stage. During the war room several issues are solved, better ideas are formed, communication is clearer between the different teams. All of this increases the efficiency and the awareness of the project itself.

10.2 Dry Runs

A dry run is a test that simulates how a failure prevention system would react in the case of an actual breakdown [6]. You could have a system that monitors the Shohoz server and sends out notifications if it goes down. A dry run verifies that

the monitoring system is setup correctly. In a dry run, the software under test is deployed to a staging environment that is identical to the production environment [6]. However, in Shohoz Food's case it is directly deployed into the production stage late into the night as orders are scarce at that time. Then several different issues and errors are forced into the app and system. A few examples are, it is forced to halt a service to imitate a crash, pull a cable to imitate a network failure, and so on until it has been confirmed that everything is working fine. Then the team waits for the response to see if there are any severe issues, such as database corruption. If such an issue exists, then necessary steps would be taken to deal with it immediately. Once everything fixed (if necessary) and good to go, the green signal is given and the new app version, or the large patch fixes are deployed into the production environment once again.

I have been part of a dry run only once thus far. This was when they were updating their current food app with a completely new version. The dry run started at 1 AM and it lasted till 7 AM. Developers, business team, and parts of the QA team were present during the dry run. As an intern I did not have much say in what happened but could only observe the whole process. As usual Shohoz's team is friendly as every while being extremely serious about the work. It was not a bad experience at all and it was a successful dry run by the end of it. Due to confidentiality requirements, I am not at the liberty to share the details of the dry run, however, a couple of major issues were faced and dealt with within a few days. Because of these issues the launch was delayed a bit, however, the update was deployed successfully and is now up and running.

10.3 Automation (Automated testing)

Automation testing is a type of software testing that compares the actual result to the intended result. This may be accomplished through the use of test scripts or other automated testing tool. Automating repeated activities and other testing duties that are difficult to accomplish manually is what test automation is for [4].

Benefits of automated testing:

- Higher accuracy
- Better reporting capabilities
- Increased coverage
- Enhanced resource efficiency
- Improved bug detection
- Increased reusability

A software tester can make mistakes when manually checking a system, especially when an application comprises hundreds to thousands of lines of code. Automation aids the QA team in avoiding human mistakes in application testing and completing

tests in less time than if done manually [3].

Right near the end of my internship with Shohoz, I was told to look into automated testing and pick up small bits and pieces. They were preparing me to becoming a full time SQA engineer for Shohoz. As a result my supervisor advised me to revise Java strictly and to get the hang of how to use Mockoon to run automated tests alongside Postman. With some guidance, I believe I would have easily gotten the grasp of automation.

Chapter 11

Self-Assessment

11.1 Overview

As I have spent more time as an intern at Shohoz, I have picked up quite a few skills and have improved a lot as a person of work space. From the verbal feedback I got from a few of my coworkers, I will assess myself a bit in the upcoming sections.

11.1.1 Attitude

When a work is assigned, I am more interested and prepared to work on it. With time, I gained more experience and am able to apply my knowledge to the work assigned to me. I am more confident and am willing to take on more tasks and handle them with care and efficiency.

11.1.2 Ability to learn

Learning is a never-ending process. There is always something or the other to learn. I am more vigilant in keeping my mind open to let in anything new and to take it in quick so that I can master the skill or new information and be able to apply it to my work as soon as possible. My superiors were always friendly and were always willing to teach me new things. I have learnt to ask questions to anyone with more experience to get a better understanding of how things work.

11.1.3 Dependability

At the onset of my internship I was given small and simple tasks. Whenever I was assigned something big, I always had supervision. As time went on, I was trusted with tasks more difficult than the last and eventually my supervisor let me work alone on my tasks confidently. As a result, with time, then decided that I was dependable.

11.1.4 Initiative

At Shohoz I learnt to take initiative. Whenever work load was low, I used to go through the sprint board to keep an eye out for new bugs or unsolved bugs. I used to complete the testing and pass it over to my supervisor for further clarification. Near the end of my term, I would get work done without constant reminders.

11.1.5 Quality and quantity of work

My supervisor and many of the dev team members were quite satisfied with my work as an intern. The credit is mainly due to my supervisor himself, however it was also my time at Shohoz working as a QA helped me improve a lot. As a result I would provide satisfactory quality of work. Similarly the work load had also increased near the end as I could handle it with ease.

11.1.6 Relationship with others

I am quite an introvert and prefer keeping to myself. However, when the need arises I do communicate with my coworkers, and in the process I have always been respectful and in many cases we did spend spare time sharing stories. Needless to say the bond with some of my coworkers were quite strong by the time my term ended at Shohoz.

11.1.7 Overall performance

My six month at Shohoz was quite educative and I gained a lot of meaningful experience. My coworkers and supervisor expressed their satisfaction with my work and they wanted me to join Shohoz as a full time employee in QA. So based on all that I would say I did perform quite well and needless to say it was enjoyable to work at Shohoz Limited.

Chapter 12

Conclusion

Practical experience is eye opening. I have learnt quite a lot of important basics about software testing. It is important to plan everything ahead before proceeding with the actual test cases and it is wise to always document everything that you do. Patience is key and nothing can be rushed as it is extremely easy to miss even the most simple and obvious of bugs. I have learnt that it is important to think of one idea in several different ways so as to make it easier for me to assess an issue from various points of view. Just because a feature worked the way it should does not mean it does not have a bug, therefore it also came to my knowledge that never stop testing right on the first attempt after it has functioned the way it did. I must run other test cases and try to find ways to break it. If it is breakable, then it means it can be improved and needs to be fixed.

I have been exposed to a multitude of scenarios for the duration of my internship which were crucial to understand before I have been assigned into the more complex aspects and features of software testing. As my time in the company went by, I have been exposed to more complex issues and have spent time with the devs during their debugging sessions to explain the issue and find ideas for a fix.

The 6 months have definitely been a great learning experience and I can say that I have managed to learn a lot through work. The most basic things that I have learnt is being on time with my deadlines, effectively working and completing tasks to manage time. Working under pressure and under scrutiny was also a necessity while working for Shohoz Limited. It was not a bad experience at all, I quite enjoyed my time here at Shohoz.

I definitely have a lot more to learn, and I took in a lot of lessons and information from my work place every day. My supervisor and coworkers were extremely friendly and helped me out quite a lot.

I was honoured when I was offered a full-time job as my supervisor and co-workers absolutely loved my performance. However, due to personal reasons I declined the offer. I had a great time at Shohoz, all the negativity that I heard about internships were proven wrong to me and I felt like I have actually learnt to do some form of work which has definitely built my confidence for the future.

Everything that is written here is of my own word and my personal experience. I have referred to some of the websites below to get a better understanding of the definitions and professional terms to use in my report. Alongside that I have also attached a google drive link to some of the non-confidential files that I have personally worked on during the internship for the reader's comfort and understanding.

Bibliography

- [1] H. K. Leung and L. White, “Insights into regression testing (software testing),” in *Proceedings. Conference on Software Maintenance-1989*, IEEE, 1989, pp. 60–69.
- [2] P. Kukhnavets, *Agile best practices: Why your team needs a war room*, hygger.io, 2018.
- [3] A. S. Gillis, *Automated testing*, TechTarget, 2019.
- [4] Anonymous, *What is automation testing (ultimate guide to start test automation)*, Software Testing Help, 2021.
- [5] S. S. S. Mahmud, *Google drive link for reference files and folders of my work at shohoz limited*. [Online]. Available: <https://drive.google.com/drive/folders/1U4fH28xPfEARwDJsH-0CRYZLkIgtdrhb?usp=sharing>.
- [6] C. Zhang, L. Lu, H. Zhou, J. Zhao, and Z. Zhang, “Debugging with online slicing and dryrun,”