
Test Document

for

BILLING 360

Version 1.00

Prepared by

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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
v1.00	Abhishek Khandelwal Ansh Agarwal Dhruv Gupta Kundan Kumar Nipun Nohria Pallav Goyal Poojal Katiyar Pragati Agrawal Saagar K V Venkatesh Akula	First version of the testing document	01/04/2024

1. Introduction

Test Strategy:

We used manual testing to test our software.

Testing period:

The majority of the testing was done after the implementation was completed. However, even during the implementation phase, we frequently did some manual testing of our code.

The Testers:

Developers were themselves the testers. However, we ensured that the person who wrote a particular functionality has not tested the same functionality.

Coverage Criteria:

We have used functional and non-functional coverage.

Tools used for testing:

We utilized **Thunder Client** to conduct comprehensive testing of our software. Thunder Client stands out as a *premier HTTP client extension* designed for Visual Studio Code, empowering developers to seamlessly test APIs and web services directly within their code editor environment. Its key advantages include:

Intuitive Interface: Thunder Client boasts an intuitive and user-friendly interface, streamlining the process of setting up and executing requests. Developers can swiftly navigate through functionalities without grappling with intricate configurations.

Seamless Integration: Thunder Client seamlessly integrates with Visual Studio Code, facilitating a smooth transition between coding and testing phases. This integration enhances workflow efficiency by eliminating the need to switch between disparate environments.

Robust Feature Set: Thunder Client offers a plethora of advanced features, including automated cookie management, comprehensive request history tracking, and readily available code snippets. These features empower developers to optimize productivity and minimize time spent on repetitive tasks.

Open Source: Thunder Client is built on open-source principles, providing developers with the freedom to utilize the tool without incurring any licensing fees. Moreover, its open nature encourages community contributions, fostering continuous improvement and innovation.

2. Unit Testing

Unit testing was mainly done using ThunderClient. Each individual unit was tested separately with special attention to inputs that may cause anomalous behaviour. Here, backend and frontend are tested as separate units. Their integration has been tested in integration testing. Testing of a backend unit includes the passing of input as a JSON object and performing the API call. Now, the obtained response is compared with the expected response. Testing of the frontend unit includes ensuring that inputs are converted into JSON objects correctly, all checks work as expected and alerts are displayed correctly.

We have performed the unit testing for each section exhaustively by using various test cases to model every possibility. For documentation, we have listed these sections. Each section deals with individual units which further contain many test cases. Repeated features like searching, sorting etc have been mentioned in only one of the sections, although they were tested in all of them.

1(a). SignUp Form

In this unit, we have tested the backend function that creates a new user.

Unit Details: [User class, registerUser() function]. Testing of this unit ensures that a new user is registered correctly with the entered details. It also ensures that no two users are registered with the same email.

Test Owner: Saagar K V

Test Date: 26/03/2024

Test Results: A new user was correctly registered. An object of the 'User' class (a new document in the 'users' collection in the database) was created with correct details. When registration was attempted with the same email again, it was disallowed by the system as expected.

Structural Coverage: Functional coverage (The controller registerUser()), Decision (and Branch) coverage (covers the check for existing user with the same email).

i) New Email:

```

POST http://localhost:5050/api/register/reg
Send

Query Headers 3 Auth Body 1 Tests Pre Run
JSON XML Text Form Form-encode GraphQL Binary

JSON Content Format
1 {
2   "firstname": "Saagar",
3   "lastname": "K V",
4   "email": "saagark@gmail.com",
5   "password": "220927",
6   "confirmPassword": "220927",
7   "gstno": "H12F412",
8   "shopname": "The Best Shop",
9   "shopaddress": "The Best Place",
10  "phonenumber": "9392726252"
11 }

Status: 200 OK Size: 285 Bytes Time: 293 ms
Response Headers 7 Cookies Results Docs
1 {
2   "firstname": "Saagar",
3   "lastname": "K V",
4   "email": "saagark@gmail.com",
5   "password": "$2b$10$kBhCwoE3DN0Y7qAAZk6Mv
       .9SKZBtzGwNlaUV1QZDE3DutL028n2G",
6   "gstno": "H12F412",
7   "shopname": "The Best Shop",
8   "shopaddress": "The Best Place",
9   "phonenumber": "9392726252",
10  "_id": "66054f1c4b89302d6d09dc53",
11  "__v": 0
12 }

```

ii) Existing email:

```

POST http://localhost:5050/api/register/reg
Send

Query Headers 3 Auth Body 1 Tests Pre Run
JSON XML Text Form Form-encode GraphQL Binary

JSON Content Format
1 {
2   "firstname": "Saagar",
3   "lastname": "K V",
4   "email": "saagark@gmail.com",
5   "password": "220927",
6   "confirmPassword": "220927",
7   "gstno": "H12F412",
8   "shopname": "The Best Shop",
9   "shopaddress": "The Best Place",
10  "phonenumber": "9392726252"
11 }

Status: 500 Internal Server Error Size: 33 Bytes Time: 199 ms
Response Headers 7 Cookies Results Docs
1 {
2   "error": "Internal Server Error"
3 }

```

1(b). Sign Up form

In this unit, we have tested the frontend associated with the sign up form.

Unit Details: [User class, Register() function]. This unit ensures that a required field is not missing. It ensures other requirements such as minimum length of password, valid email format, agreement to terms and conditions and equality of entry in password and confirm password fields. It also confirms that details are correctly converted to JSON object to be sent in the request to the backend.

Test Owner: Venkatesh Akula

Test Date: 26/03/2024

Test Results: Alerts were shown if an entry is invalid or if a required field is missing. The details were correctly converted to a JSON object.

Structural Coverage: Covers the code in Register.js file, Branch coverage (covers the check for valid format of credentials and missing credentials).

Check for password being at least 6 characters:

The screenshot shows a sign-up form titled "Fill Details". At the top, a black alert box displays the message "billing-360-dev-1.onrender.com says" and "Password should be at least 6 characters" with an "OK" button. Below the alert, the form fields are visible: Name (Pooja, Katiyar), Email (poojalk22@iitk.ac.in), Phone (+918009259892), Address (Gada, NC 27, IFFCO Phulpur Township Allaha), and a numeric field (2). A checkbox for agreeing to terms and conditions is checked. A "Sign up" button is present, along with a link to "Sign in". The footer contains the copyright notice "Billing 360 © 2024 Copyright All Rights Reserved."

Check for password and confirm Password being equal:

The screenshot shows a sign-up form titled "Fill Details". At the top, a black alert box displays the message "billing-360-dev-1.onrender.com says" and "Password and Confirm Password do not match" with an "OK" button. Below the alert, the form fields are visible: Name (Pooja, Katiyar), Email (poojalk22@iitk.ac.in), Phone (+918009259892), Address (Gada, NC 27, IFFCO Phulpur Township Allaha), and two password fields (.....,). A numeric field (2) is also present. A checkbox for agreeing to terms and conditions is checked. A "Sign up" button is present, along with a link to "Sign in". The footer contains the copyright notice "Billing 360 © 2024 Copyright All Rights Reserved."

Upon entering valid details, the JSON object is correctly created to be sent in the request to the backend:



Billing 360

Fill Details

Saagar	K V
saagar22@iitk.ac.in	9392725262
VBSA	Amp, AP, IN
.....
56789GHT	

I Agree to the Terms & Conditions

Sign up

(Entered details in SignUp form)

```
{
  firstname: 'Saagar',
  lastname: 'K V',
  email: 'saagar22@iitk.ac.in',
  password: '123456',
  confirmppassword: '123456',
  gstno: '56789GHT',
  shopname: 'VBSA',
  shopaddress: 'Amp, AP, IN',
  phonenumer: '9392725262'
}
```

(JSON object logged onto the console)

2(a). Login Form

In this unit, we have tested the backend functions that control authentication.

Unit Details: [User class, loginUser() function]. Testing of this unit ensures that a valid user is allowed to sign in, if the entered details are correct. It also ensures that an unauthenticated user is not allowed to sign in.

Test Owner: Venkatesh Akula

Test Date: 26/03/2024

Test Results: An authenticated user (valid details) was allowed to log in successfully. An unauthenticated user was prevented from logging in.

Structural Coverage: Functional coverage (covers the loginUser() and getUserData() functions), Branch coverage (covers the check for valid credentials).

i) Valid credentials:

The screenshot shows a Postman request to `http://localhost:5050/api/login/log/in`. The request method is POST, and the body is a JSON object with fields `email` and `password`. The response status is 200 OK, size is 268 Bytes, and time is 215 ms. The response body contains a JSON object with various fields like `_id`, `firstname`, `lastname`, `email`, `password`, `gstno`, `shopname`, `shopaddress`, `phononenumber`, and `_v`.

```

POST http://localhost:5050/api/login/log/in
{
  "email": "akulav22@iitk.ac.in",
  "password": "17291729"
}
Status: 200 OK  Size: 268 Bytes  Time: 215 ms
{
  "_id": "65f854d3b3861f27aaaf3811",
  "firstname": "Venkatesh",
  "lastname": "Akula",
  "email": "akulav22@iitk.ac.in",
  "password": "$2b$10$HW17EMNxqwpS.VFga9VfV
.aymilbZzgLSOA6bmrfQ0GhbMtgWlQlz6",
  "gstno": "1729",
  "shopname": "abc",
  "shopaddress": "xyz",
  "phononenumber": "9014764100",
  "_v": 0
}
  
```

ii) Invalid credentials:

The screenshot shows a Postman request to `http://localhost:5050/api/login/log/in`. The request method is POST, and the body is a JSON object with fields `email` and `password`. The response status is 401 Unauthorized, size is 31 Bytes, and time is 178 ms. The response body contains a JSON object with an `error` field.

```

POST http://localhost:5050/api/login/log/in
{
  "email": "akulav22@iitk.ac.in",
  "password": "1729"
}
Status: 401 Unauthorized  Size: 31 Bytes  Time: 178 ms
{
  "error": "Invalid Credentials"
}
  
```

2(b). Login Form

In this unit, we have tested the frontend associated with the login form.

Unit Details: [User class, Login() function]. This unit ensures that no field is missing and details are correctly converted to JSON object to be sent in the request to the backend.

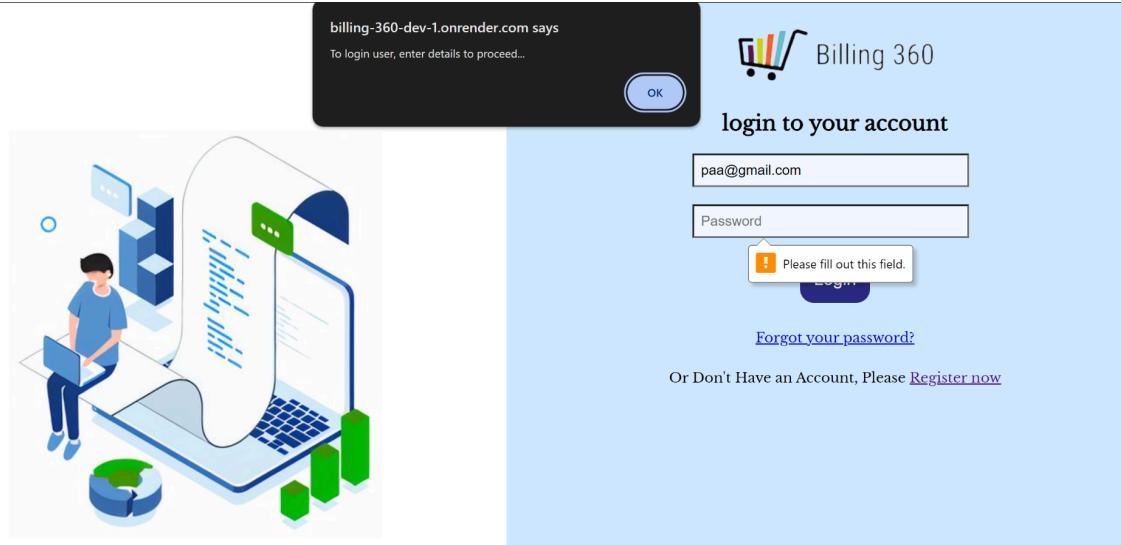
Test Owner: Venkatesh Akula

Test Date: 26/03/2024

Test Results: Alerts were shown if a field is missing. The details were correctly converted to a JSON object.

Structural Coverage: Covers the code in Login.js file, Branch coverage (covers the check for missing credentials).

Missing credential:



3. Dashboard

This unit deals with the backend that controls the fetching of data and calculation of information to be displayed on the dashboard.

Unit Details: [Transaction class, getDashboardData() function]

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: Data obtained was correct.

Structural Coverage: Functional coverage (It covers getDashboardData() function).

Header	Value
Accept	*
User-Agent	Thunder Client (https://www.thunderclient.net)
Content-Type	application/json

```

Status: 200 OK  Size: 100 Bytes  Time: 111 ms
Response Headers: 7
{
  "totalSellingPrice": 400,
  "totalCostPrice": 356,
  "numberOfInvoices": 1,
  "totalSellingPriceYesterday": 900
}
  
```

4. Invoice

a) (i) Add new invoice (backend testing)

In this unit, we have tested whether a new invoice gets generated correctly (backend testing).

Unit Details: [Invoice class, addInvoice() function].

Test Owner: Saagar K V

Test Date: 26/03/2024

Test Results: An invoice was correctly generated. A new invoice object (a new document in the ‘invoices’ collection) was created in the database.

Structural Coverage: Functional coverage (covers the addInvoice() function), Branch coverage (covers the two possibilities which arise depending on whether the customer is new or already existing).

Two different test cases are required for branch coverage:

i) Existing Customer :

Invoice was correctly generated and added to the customer’s invoice list.

```

POST http://localhost:5050/api/invoice/add
Send

Status: 200 OK  Size: 490 Bytes  Time: 681 ms

Response Headers 7 Cookies Results Docs

1   "userID": "65f68027d9e504dee799d768",
2   "invoiceID": 60,
3   "customerName": "Saagar",
4   "phoneNo": "9392725262",
5   "customerEmail": "saagarkv2005@gmail.com",
6   "totalAmount": 218,
7   "notes": "Thanks for your visit. Come Again",
8   "paymentMode": "Paid",
9   "discount": 0,
10  "itemList": [
11    {
12      "itemID": "b",
13      "itemName": "a",
14      "quantity": 2,
15      "costPrice": 69,
16      "rate": 100,
17      "gst": 9,
18      "amount": 218,
19      "_id": "66041ddcf76121f7808d4103"
20    }
21  ],
22  "createdAt": "2024-03-26T03:33:00.000Z",
23  "totalCostPrice": 138,
24  "totalGst": 20
25

```

ii) New Customer:

A new customer was created. The newly generated invoice was added to his invoice list.

The screenshot shows a Postman API test result for the endpoint `http://localhost:5050/api/invoice/add`. The request method is POST. The response status is 200 OK, size is 487 Bytes, and time taken is 552 ms. The response body is a JSON object representing an invoice. The JSON content is as follows:

```

1  {
2      "userID": "65f68027d9e504dee799d768",
3      "invoiceID": 61,
4      "customerName": "Venkatesh",
5      "phoneNo": "9392725262",
6      "customerEmail": "akulav@gmail.com",
7      "totalAmount": 218,
8      "notes": "Thanks for your visit. Come Again",
9      "paymentMode": "Paid",
10     "discount": 0,
11     "itemList": [{"_id": "66041ddcf76121f7808d4103", "itemID": "b",
12         "itemName": "a", "quantity": 2, "costPrice": 69, "rate": 100, "gst": 9
13         , "amount": 218 }],
14     "createdAt": "Tue, Mar 26, 2024, 10:03 AM"
15   }
16
17   ],
18   "createdAt": "2024-03-26T04:33:00.000Z",
19   "totalCostPrice": 138,
20   "totalSales": 200
21
22
23
24
25

```

(ii) Add new invoice (frontend testing)

In this unit, we have tested the frontend associated with the invoice generation page.

Unit Details: [User class, AddNewInvoice() function]. This unit ensures that no field is missing and details are correctly converted to a JSON object to be sent in the request to the backend. It also ensures that email and phone number are of the correct format. It prevents generation of empty bills as well.

Test Owner: Venkatesh Akula

Test Date: 26/03/2024

Test Results: Valid details were correctly converted to a JSON object. In case of invalid details, appropriate alerts were shown.

Structural Coverage: Covers the code in AddInvoice.js file, Branch coverage (covers the checks for validity of various credentials).

Details entered while creating new invoice

The screenshot shows the Billing 360 software interface. On the left, there is a sidebar with various navigation options: Dashboard, Invoice (selected), Inventory, Pending Transactions, Transaction History, Reports, FAQs, and Contact Us. The main area is titled "Invoice". It displays customer details: Arjuna, InvoiceID : 112, and arjuna@iitk.ac.in, phone number 2532532530. Below this is a table for "Item Details" with one row: item abc, quantity 5, price 10, GST 2, amount 51. There is a "Discount (%): 0" field. A "Customer Notes:" section contains the message "Thanks for your visit. Come Again!".

JSON object logged onto the console

```

req: {
  userID: '65f68027d9e504dee799d768',
  invoiceID: 112,
  customerName: 'Arjuna',
  phoneNo: '2532532530',
  customerEmail: 'arjuna@iitk.ac.in',
  totalAmount: 51,
  notes: 'Thanks for your visit. Come Again!',
  paymentMode: 'Paid',
  discount: 0,
  itemList: [
    {
      _id: '6607e53df64c8bfe26cdcbcfe',
      itemID: '',
      itemName: 'abc',
      quantity: 5,
      costPrice: 9,
      rate: 10,
      gst: 2,
      amount: 51
    }
  ],
  createdAt: '2024-04-01T21:20:08.212Z'
}
  
```

II) If customer details are not entered while generating bill.

Result: Invoice is not added and message is generated.

The screenshot shows the Billing 360 software interface. At the top, there are links for Standings, Assessments, and a menu icon. The main area has a blue header "Invoice". A message box says "billing-360-dev-1.onrender.com says Please fill Customer Email". Below this, there is a button labeled "OK". At the bottom, there are fields for "Customer Email" and "Customer Phone No".

III)f product Name is not added

Result:No error is generated and invoice is still generated.

Infinity

GST No. : H12F412

Address : Can't reach

Email: saagarkopparam@gmail.com

Phone No.: 9392725262

Billed To:

nipun

Invoice ID #115

Created at: Mon, Apr 01, 2024, 10:50 PM

nipun22@iitk.ac.in

STATUS: Paid

8556827697

Summary

No.	Item	Price	GST (%)	Quantity	Total
1		₹ 0.00	0	2	₹ 0.00
Sub Total :					₹ 0
Discount :					- ₹ 0
Grand Total :					₹ 0.00

Customer Notes

Thanks for your visit. Come Again!

IV)Negative quantity is inputted.

Result:Negative sign is not typed in quantity input space.

b) Counting number of invoices:

In this unit, we have tested whether the number of invoices generated by a particular user (shopkeeper) is counted correctly (backend testing)

Unit Details: [Invoice class, getInvoiceCount() function]. Testing of this unit ensures that the counting of invoices of a particular user is correct. This is crucial since this count is used to generate invoice ID which must be unique for each invoice.

Test Owner: Saagar K V

Test Date: 27/03/2024

Test Results: The number of invoices returned was correct.

Structural Coverage: Functional coverage (covers the getInvoiceCount() controller function)

```

GET http://localhost:5050/api/invoice/count/65f68027d9e504dee799d768 Send
Status: 200 OK Size: 12 Bytes Time: 128 ms
Response Headers 7 Cookies Results Docs
1 {
2   "count": 62
3 }

```

The screenshot shows a screenshot of the Thunder Client interface. On the left, there's a configuration panel with a 'Headers' tab selected, showing three checked items: 'Accept' (value: */*), 'User-Agent' (value: Thunder Client (https://www.thunderclient.com)), and 'Content-Type' (value: application/json). On the right, the results panel shows a successful '200 OK' response with a size of 12 bytes and a duration of 128 ms. The response body is a JSON object with a single key 'count' set to 62.

c) Generating PDF of invoice:

In this unit, we have tested the generation of invoice in pdf format (backend testing).

Unit Details: [Invoice class, generatePdf() function].

Test Owner: Saagar K V

Test Date: 27/03/2024

Test Results: The pdf was generated successfully.

Structural Coverage: Functional coverage (covers the generatePdfBuffer() function).

Additional comments: The time taken for generating the pdf was found to be variable. However, the time taken was found to lie in the range 1.5-2.5s, except during the first operation of the function when it takes 7-15s.

During testing, the time in the 'createdAt' field is given with respect to GMT, which is the case with the Date() function that has been actually used to obtain the current date and time in the function.

POST <http://localhost:5050/api/generate-pdf>

Status: 200 OK Size: 31.56 KB Time: 1.82 s

Response Headers 8 Cookies Results Docs

JSON XML Text Form Form-encode GraphQL Binary

JSON Content

```

1  {
2    "invoiceData": {
3      "userID": "65f68027d9e504dee799d768",
4      "invoiceID": 63,
5      "customerName": "w",
6      "phoneNo": "9392725262",
7      "customerEmail": "saagarkopparam@gmail.com",
8      "totalAmount": 218,
9      "notes": "Thanks for your visit. Come Again!",
10     "paymentMode": "Paid",
11     "discount": 0,
12     "itemList": [
13       {
14         "_id": "66041ddcf76121f7808d4103",
15         "itemID": "b",
16         "itemName": "a",
17         "quantity": 2,
18         "costPrice": 69,
19         "rate": 100,
20         "gst": 9,
21         "amount": 218
22       }
23     ],
24     "createdAt": "Wed, Mar 27, 2024, 11:16 AM"
25   },
26   "userID": "65f68027d9e504dee799d768"
27 }
```

The response is binary file, display not supported

Save File Open in Code

invoice.pdf 1 / 1 - 172% + ⌂ ⌂ ⌂

Infinity

GST No. : H12F412
Address : Can't reach
Email: saagarkopparam@gmail.com
Phone No.: 9392725262

Billed To: **Invoice ID #63**
Saagar
saagarkv2005@gmail.com
9392725262
Created at: Wed, Mar 27, 2024, 05:46 AM
STATUS: Paid

Summary

No.	Item	Price	GST (%)	Quantity	Total	
1	a	₹ 100.00	9	2	₹ 218.00	
					Sub Total :	₹ 218
					Discount :	- ₹ 0
					Grand Total :	₹ 218

Customer Notes
Thanks for your visit. Come Again!

d) Sending the invoice to the customer via mail:

In this unit, we have tested the feature concerning the sending of mail to the customer (backend testing).

Unit Details: [Invoice class, sendInvoiceMail() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The mail was sent successfully with attached invoice, in pdf format.

Structural Coverage: Functional coverage (covers the generatePdfBuffer(), sendInvoiceMail() and sendInvoiceMailController() functions). It also confirms that 'nodemailer' works correctly.

Additional comments: The time taken for sending mail was found to be in the range 5-6s.

The screenshot shows a POST request to `http://localhost:5050/api/invoice/sendmail`. The request body is a JSON object representing an invoice. The response status is **200 OK**, size is **31.54 KB**, and time taken is **5.53 s**. The response content is binary and not displayed.

```

1  {
2    "invoiceData":
3    { "userId": "65f68027d9e504dee799d768",
4      "invoiceID":55,
5      "customerName": "xyz",
6      "phonenumber": "1234567890",
7      "customerEmail": "saagarkv2005@gmail.com",
8      "totalAmount": 109,
9      "notes": "Thanks for your visit. Come Again!",
10     "paymentMode": "Paid",
11     "discount": 0,
12     "itemlist": [
13       {
14         "itemID": "",
15         "itemName": "a",
16         "quantity": 1,
17         "costPrice": 69,
18         "rate": 100,
19         "amt": 0
20       }
21     ]
22   }
23 }
```

The screenshot shows an incoming email from **Billing 360 <billing360iitk@gmail.com>** to me. The subject is **15:21 (0 minutes ago)**. The email content is as follows:

Billing 360

This is to inform you of your purchase at Infinity.
Please find attached the invoice.
If there is any discrepancy, please reach out to the vendor.
Email : saagarkopparam@gmail.com
Address : Can't reach

Author
[Billing 360](#)

One attachment • Scanned by Gmail ⓘ

5. Pending transactions

a) Fetch all customers with non-zero credit

In this unit, we have tested whether all customers with non-zero credit are correctly fetched from the database (backend testing).

Unit Details: [Customer class, getCreditCustomers() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The result obtained was correct.

Structural Coverage: Functional coverage (covers the getCreditCustomers() controller).

```

1 [
2   {
3     "id": "65f68027d9e50",
4     "userIP": "65f68027d9e50",
5     "name": "John Doe",
6     "phone": "+919876543210",
7     "email": "john.doe@gmail.com",
8     "password": "password123",
9     "isDeleted": false
10    "customer": [
11      "65f68027d9e50",
12      "65f68027d9e50",
13      "65f68027d9e50",
14      "65f68027d9e50",
15      "65f68027d9e50",
16      "65f68027d9e50",
17      "65f68027d9e50",
18      "65f68027d9e50",
19      "65f68027d9e50",
20      "65f68027d9e50",
21      "65f68027d9e50",
22      "65f68027d9e50",
23      "65f68027d9e50",
24      "65f68027d9e50",
25      "65f68027d9e50",
26      "65f68027d9e50",
27      "65f68027d9e50",
28      "65f68027d9e50",
29      "65f68027d9e50"
30    ],
31    "isDeleted": false
32  }
33 ]
34 ]
35 ]
36 ]
37 ]
38 ]
39 ]
40 ]
41 ]
42 ]

```

Frontend testing : All customers with non-zero credit amount were correctly displayed under the credit-tab. The total credit amount was also calculated correctly and displayed. Toggling of bars worked as expected. Under the debit tab, all suppliers with non-zero debit were displayed and the correct total debit amount was displayed. This covers the testing of fetchCreditCustomers(), fetchDebitSuppliers() and handleTotalAmt() functions in the frontend.

b) Find Existing Customer

In this unit, we have tested the function that returns a customer with a given email, if such a customer exists. Note that every customer is uniquely mapped (one-to-one) with an email.

Unit Details: [Customer class, existingCustEmail() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The result obtained was correct. If such a customer didn't exist, it returned null as expected.

Structural Coverage: Functional coverage (covers the existingCustEmail() function).

Two separate test cases were used:

- There is an existing customer with that email

```

Status: 200 OK  Size: 945 Bytes  Time: 1.22 s
Response Headers 15 Cookies Results ⚙️
1   {
2     "_id": "65f834f7b93a8f08caac0cf6",
3     "userID": "65f68027d9e504dee799d768",
4     "name": "saagar",
5     "phoneNo": "9392725262",
6     "email": "saagarkv2005@gmail.com",
7     "creditAmount": 210.32,
8     "invoiceList": [
9       "65f834f7b93a8f08caac0cf9",
10      "65f83541b93a8f08caac0d01",
11      "65f835ba3b0f5d414ad87f8a",
12      "65f836df86fd05d579aac56a",
13      "65f83a07db54a2e29b06f17",
14      "65f83acfaec50c7a088626e1",
15      "65f83bd6ef763b01e2555d8",
16      "65f83c19ef763b01e2555e0",
17      "65f846bb46260a3b1350e618",
18      "65f8479846260a3b1350e642",
19      "65f84c11fa7cd4088010ecae",
20      "65f84cb70bbf6af5c9ab91b",
21      "65f84d5aaff15aefae6d95b",
22      "65f84d93aff15aefae6d9563",
23      "65f84e9d72beac33160c4ed4",
24      "65f8869a8cded3e59a69003b"
]

```

ii) There is no such customer

```

Status: 200 OK  Size: 4 Bytes  Time: 1.22 s
Response Headers 15 Cookies Results ⚙️
1   null

```

c) (i) Add New Customer (backend testing)

In this unit, we have tested the addition of a new customer into the database (backend testing).

Unit Details: [Customer class, AddNewCredit() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The customer was correctly added. A new document was successfully created in the ‘customers’ collection.

Structural Coverage: Functional coverage (covers the AddNewCredit() controller function)

The screenshot shows the Postman interface with a successful API call. The URL is <https://billing-360-dev.onrender.com/api/pendingTransactions/addNewCredit>. The response status is 201 Created, size is 183 Bytes, and time taken is 580 ms. The JSON response body is:

```

1  {
2    "userID": "65f68027d9e504dee799d768",
3    "name": "Madhav",
4    "phoneNo": "1234567890",
5    "email": "madhav@gmail.com",
6    "creditAmount": 140.76,
7    "invoiceList": [],
8    "_id": "6607c191d027820c873cd996",
9    "__v": 0
10   }

```

(ii) Add New Customer (frontend testing)

In this unit, we have tested the addition of a new customer into the database (frontend testing).

Unit Details: [Customer class, AddNewEntry() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: If entered details are valid, it was correctly converted to a JSON object for sending the request to the backend. It checked if the phone number and email are of a valid format. It also required the amount to be a positive number. It also disallowed the addition of a new customer with an email that is associated with an already existing customer. However, we recognised a problem - there was no way to add credit for a customer whose record exists in the database but currently has zero credit (and thus is not displayed in this section), although he's not actually a 'new' customer.

Debugging: We resolved the bug by using a prompt that pops up whenever the user tries to add a new customer with an existing email, asking if he would like to apply this change to the already existing record.

Structural Coverage: Functional coverage (covers the AddNewEntry() and ExistingEntry() functions in the frontend), Branch Coverage (various possibilities based on validity of phone number, validity of email, validity of amount and existing email).

Within this, **multiple test cases** were used to test various possibilities. Some of them are shown here.

i) Invalid email:

The screenshot shows a 'New Entry' form on the left and a 'Pending' transaction summary on the right.

New Entry Form:

- Name: abcd
- Phone Number: 1234567890
- Email: s@com
- Amount: 124

Pending Transaction:

- localhost:3000 says Please enter valid email
- Pending
- Search
- Credit

ii) Existing Email:

The screenshot shows a 'New Entry' form on the left and a confirmation dialog on the right.

New Entry Form:

- Name: abcd
- Phone Number: 9876543210
- Email: saagarkv2005@gmail.com
- Amount: 125

Confirmation Dialog:

There already exists a Customer with name 'Saagar' associated with this email. Do you want to add this amount to Saagar's log?

Yes No

iii) Valid details entered:

The screenshot shows a 'Pending Transactions' dashboard with a 'New Entry' modal open.

Pending Transactions Dashboard:

- sun electronics 11222
- Dashboard
- Invoice
- Inventory
- Pending Transactions
- Transaction History
- Reports
- FAQs
- Contact Us

New Entry Modal:

- Name: Nipun
- Phone Number: 8556827697
- Email: nipun22@iitk.ac.in
- Amount: 50

Total Credit 0.00

Debit

Add New Customer

JSON Object Logged onto the console:

```
{
  userID: '65f68027d9e504dee799d768',
  partyName: 'Nipun',
  phoneNumber: '8556827697',
  email: 'nipun22@iitk.ac.in',
  amount: '50'
}
```

d) Update Customer

In this unit, we have tested the updation of an existing customer in the database (backend testing). Frontend testing was also performed and results were as expected. It checked if the phone number and email are of a valid format and displayed alerts just like in the above case.

Unit Details: [Customer class, UpdateCustomer() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The customer was correctly updated.

Structural Coverage: Functional coverage (covers the UpdateEntry() function in the frontend and the corresponding controller), Branch Coverage (various possibilities based on validity of phone number and validity of email).

The screenshot shows a Postman API request for updating a customer. The URL is <https://billing-360-dev.onrender.com/api/pendingTransactions/updateCustomer>. The method is PUT. The response status is 200 OK, size is 939 Bytes, and time is 672 ms. The request body is a JSON object with fields: _id, phoneNo, and email. The response body is a large JSON array of 24 objects, each containing an _id, name, phoneNo, email, creditAmount, and invoiceList.

Index	_id	name	phoneNo	email	creditAmount	invoiceList
1	"65f834f7b93abf08cac0cf6"				210.32	[...]
2	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
3	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
4	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
5	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
6	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
7	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
8	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
9	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
10	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
11	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
12	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
13	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
14	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
15	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
16	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
17	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
18	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
19	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
20	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
21	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
22	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
23	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		
24	"65f834f7b93abf08cac0cf6"	"Saagar"	"1234567890"	"saagar@gmail.com"		

e) Clear Dues/ Add Amount

In this unit, we have tested the updation of the pending credit amount of an existing customer in the database (backend testing). Frontend testing was also performed and expected results were obtained. It was checked if the amount was a valid positive number. An alert was displayed otherwise.

Unit Details: [Customer class, updateAmount() function].

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The customer amount was correctly updated.

Structural Coverage: Functional coverage (covers the updateAmount() function)

The screenshot shows a POST request to `https://billing-360-dev.onrender.com/api/pendingTransactions/updateCustAmt`. The request body is a JSON object with the following content:

```

1 {
2   "_id": "65f84b6446260a3b1350e67a",
3   "userID": "65f68027d0e504dee799d768",
4   "name": "abc",
5   "phoneNo": "1536378921",
6   "email": "abc@abc.com",
7   "creditAmount": 296.23,
8   "invoiceList": [
9     "65f84b5b46260a3b1350e66d",
10    "6606b329632be3a6fbfeb007"
11  ],
12  "_v": 1
13 }

```

The response status is 200 OK, size is 228 Bytes, and time taken is 1.26 s.

Note:

- The Supplier class also uses the same functions for above operations (polymorphism). The function chooses between customer and supplier based on the value of a variable 'entryType'. Thus, testing of one case automatically completes the testing of the other. However, both cases were tested separately and similar results were obtained.
- Features such as the sending of email and adding invoice to customer list were tested in the 'Invoice' section. However, it was verified that those functions are correctly invoked, from this section, and correct results were obtained.

f) Search by Name

In this unit, we have tested whether the search bar filters the customers correctly.

Unit Details: [Customer class, SearchCreditCustomers].

Test Owner: Nipun

Test Date: 28/03/2024

Test Results: The customers corresponding to the search parameters are shown..

Structural Coverage: Functional coverage (covers the SearchCreditCustomers() function)

					Total Credit
				Credit	Debit
CustomerName	Phone No	Email	Amount	Add New Customer	
zero	0000243536	xminusx@null.com	700	<button>Clear Dues</button>	<button>Add to Credit</button>
one	1	xbyx@xneqzero.com	8572.13	<button>Clear Dues</button>	<button>Add to Credit</button>
two	2	smallestPrime@binary.bin	999.24	<button>Clear Dues</button>	<button>Add to Credit</button>
three	3	2plus1@three.com	234.76	<button>Clear Dues</button>	<button>Add to Credit</button>
Saagar	1234567890	saagar@gmail.com	410.32	<button>Clear Dues</button>	<button>Add to Credit</button>

					Total Credit
				Credit	Debit
CustomerName	Phone No	Email	Amount	Add New Customer	
Saagar	1234567890	saagar@gmail.com	410.32	<button>Clear Dues</button>	<button>Add to Credit</button>

6. Transaction History

Search by Customer Name

In this unit, we have tested the search feature. Upon searching a customer name, all transactions associated with that customer show up, hiding the others. Note that we have

used search using regular expressions, thus all customers whose names contain the given pattern (case insensitive) will be considered for display (backend testing).

Unit Details: [Invoice class, searchInvoice() function]

Test Owner: Saagar K V

Test Date: 28/03/2024

Test Results: The search was successful and worked as expected.

Structural Coverage: Functional coverage (covers the searchInvoice() controller function)

Frontend testing was also performed. The search query entered by the user was correctly taken and sent in the request to the backend. The data displayed to the user matched with the response obtained during backend testing, thus confirming the proper working of fetchSearchData() function in the frontend as well.

The screenshot shows a POST request to `http://localhost:5050/api/invoice/search/65f68027d9e504dee799d768?customerName=xy`. The 'Query' tab is selected, showing a parameter `customerName` with value `xy`. The 'Response' tab displays the JSON response from the server, which contains two invoice objects. Both invoices have a `customerName` of `xy`, `customerEmail` of `"xy@gmail.com"`, and `customerMobile` of `"9876543210"`. One invoice has a `status` of `"New order"` and the other has `"Order placed"`.

```

    "id": 1,
    "customerName": "xy",
    "customerEmail": "xy@gmail.com",
    "customerMobile": "9876543210",
    "status": "New order",
    "paymentMode": "Account added to credit",
    "amount": 10000,
    "date": "2024-03-28T10:10:10Z",
    "totalAmount": "10000.00 INR/₹10,000",
    "totalQuantity": 10,
    "customerAddress": "123 Main St, New York, NY 10001, USA",
    "customerLatitude": 40.7128,
    "customerLongitude": -74.0060
  },
  {
    "id": 2,
    "customerName": "xy",
    "customerEmail": "xy@gmail.com",
    "customerMobile": "9876543210",
    "status": "Order placed",
    "paymentMode": "Bank transfer",
    "amount": 10000,
    "date": "2024-03-28T10:10:10Z",
    "totalAmount": "10000.00 INR/₹10,000",
    "totalQuantity": 10,
    "customerAddress": "123 Main St, New York, NY 10001, USA",
    "customerLatitude": 40.7128,
    "customerLongitude": -74.0060
  }
]
  
```

7. Inventory

a) Add new batch:

In this unit, we have tested whether a new batch is getting correctly added or not (backend testing).

Unit Details: [Item class, addBatchList() function]

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: New batch is correctly added if all details are entered.

Structural Coverage: Functional coverage (covers the addBatchList() controller function).

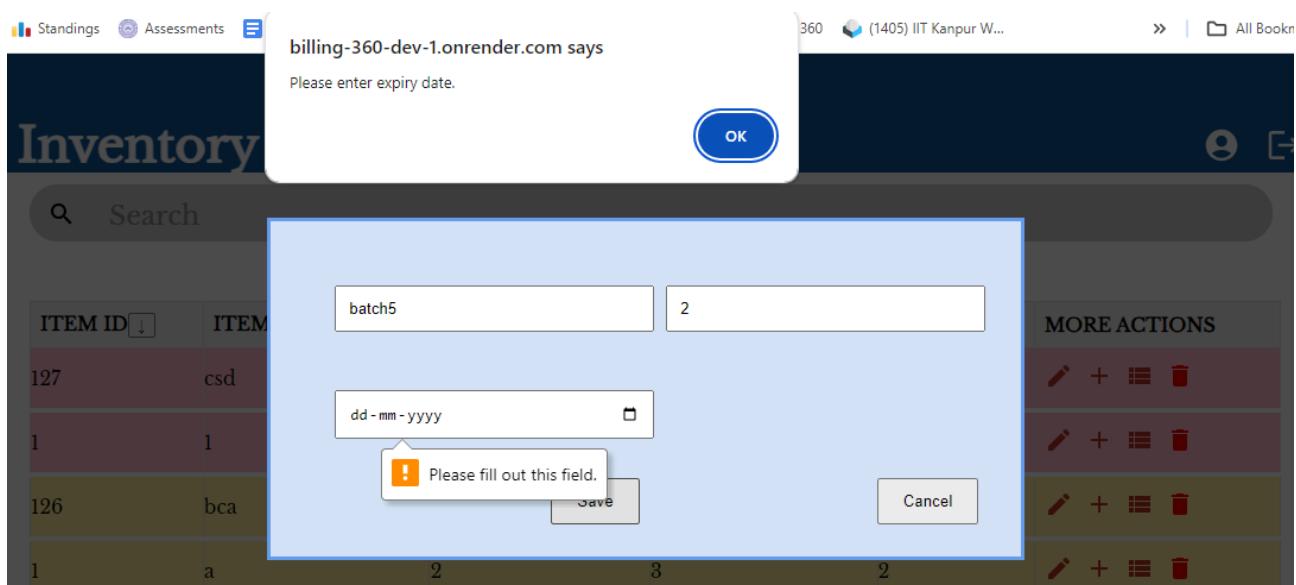
```

POST http://localhost:5050/api/inventory/addBatchList
{
  "message": "BatchList added successfully",
  "product": {
    "_id": "66041ddcf76121f7808d4103",
    "userID": "65f68027d9e504dee799d768",
    "itemID": "b",
    "itemName": "a",
    "salePrice": 100,
    "costPrice": 69,
    "itemGST": 9,
    "category": "x",
    "discount": 0,
    "quantity": 10000138,
    "batchList": [
      {
        "batchID": "one",
        "batchQty": 9999988,
        "expiryDate": "2024-04-06T00:00:00Z",
        "_id": "66041df1f76121f7808d4106"
      },
      {
        "batchID": "B1Blr",
        "batchQty": 150,
        "expiryDate": "2025-03-28T00:00:00Z",
        "id": "6605a1974b89302d6d09dc75"
      }
    ]
  }
}
  
```

Frontend testing:

I) If all details are not entered

Result: Message is displayed asking for missing details.

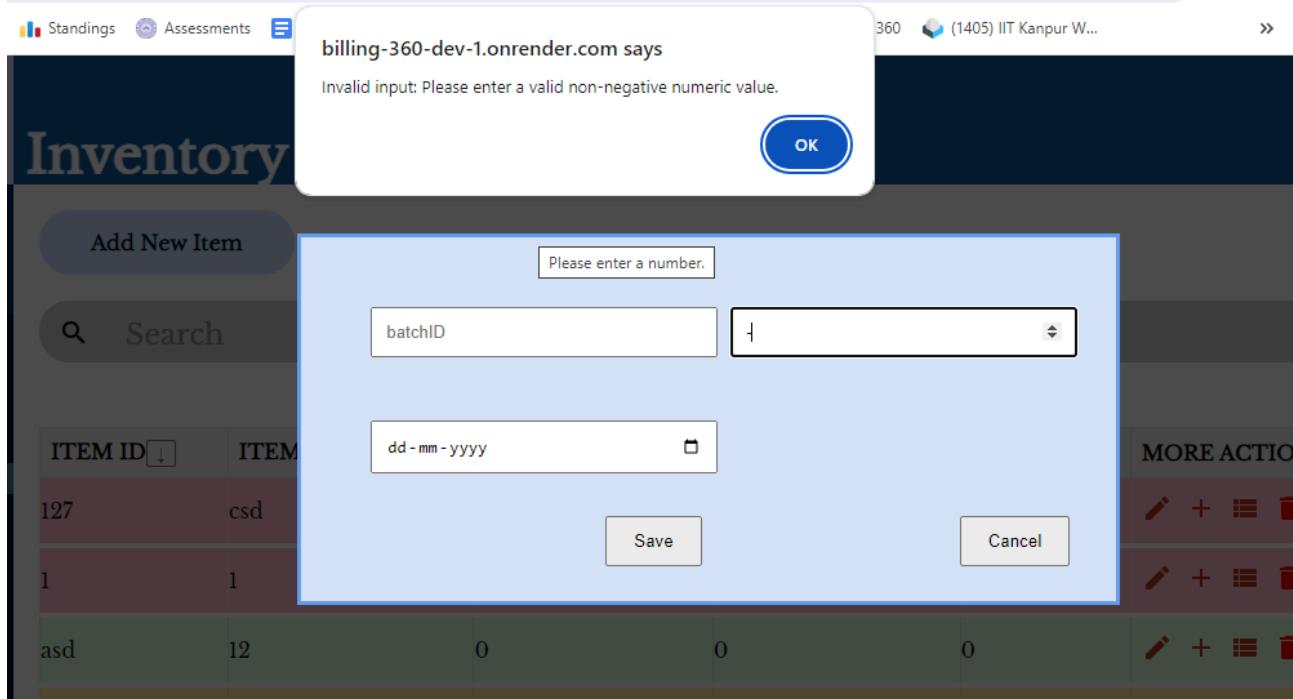


II) If invalid input is added (eg-alphabets for quantity)

Result: Invalid characters are not added in the input space.

III) If negative values are added for Number inputs

Result: Error message is displayed asking non-negative inputs.



b) Add new Product:

In this unit, we have tested whether a new product is getting added correctly or not (backend testing).

Unit Details: [Item class, addProduct() function].

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: New product is correctly added to the database.

Structural Coverage: Functional coverage (covers the addProduct() controller function).

```

POST ▼ http://localhost:5050/api/inventory/add Send
Query Headers 3 Auth Body 1 Tests Pre Run
JSON XML Text Form Form-encode GraphQL Binary
JSON Content Format
1 {
  "userID": "65f68027d9e504dee799d768",
  "itemID": "w",
  "itemName": "d",
  "salePrice": 200,
  "costPrice": 178,
  "itemGST": 3,
  "category": "y",
  "discount": 0,
  "quantity": 0
}
Status: 200 OK Size: 206 Bytes Time: 163 ms
Response Headers 7 Cookies Results Docs { } ⌂
1 {
  "userID": "65f68027d9e504dee799d768",
  "itemID": "w",
  "itemName": "d",
  "salePrice": 200,
  "costPrice": 178,
  "itemGST": 3,
  "category": "y",
  "discount": 0,
  "quantity": 0,
  "_id": "6605b506b86e5750135e57e5",
  "batchList": [],
  "__v": 0
}
Copy
Response Chart ⌂

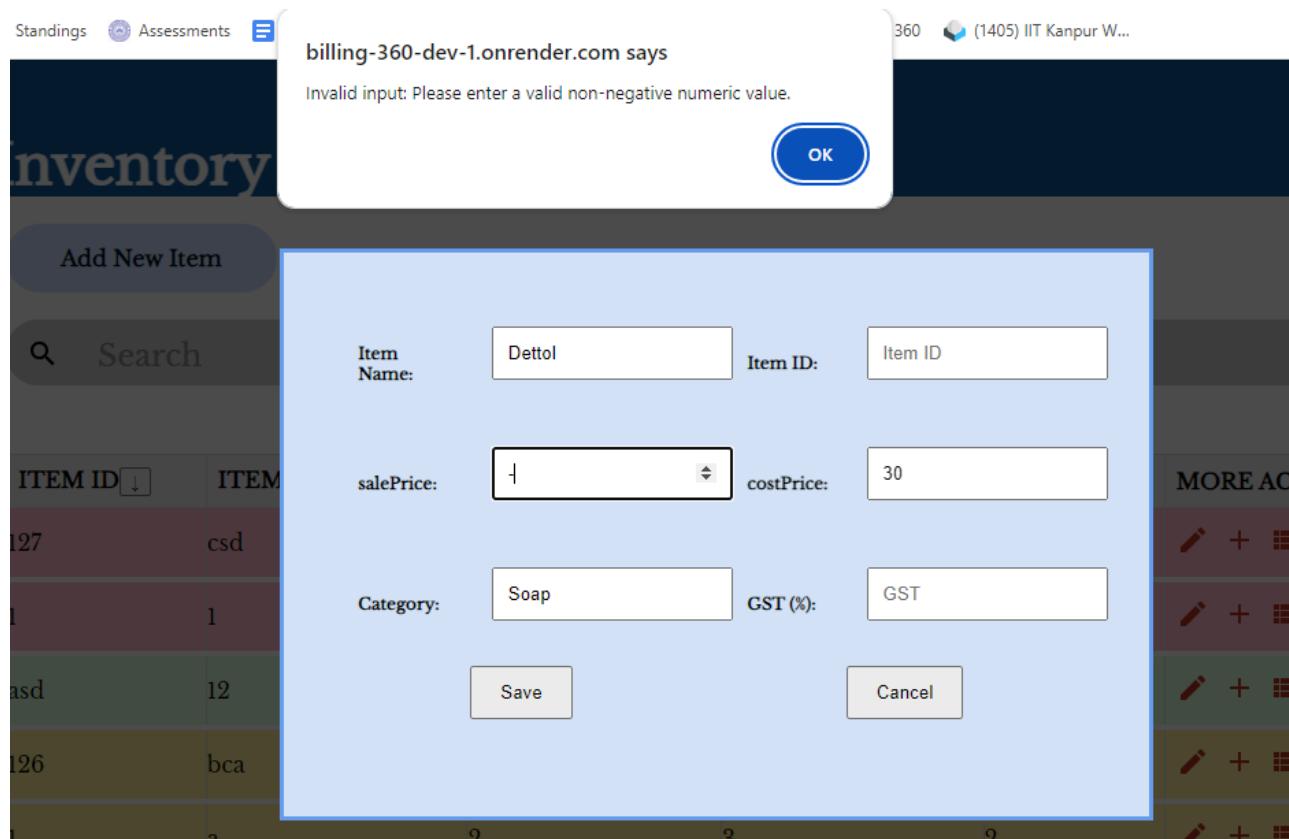
```

Frontend:

I) If invalid details are entered. (for example, alphabets for GST)

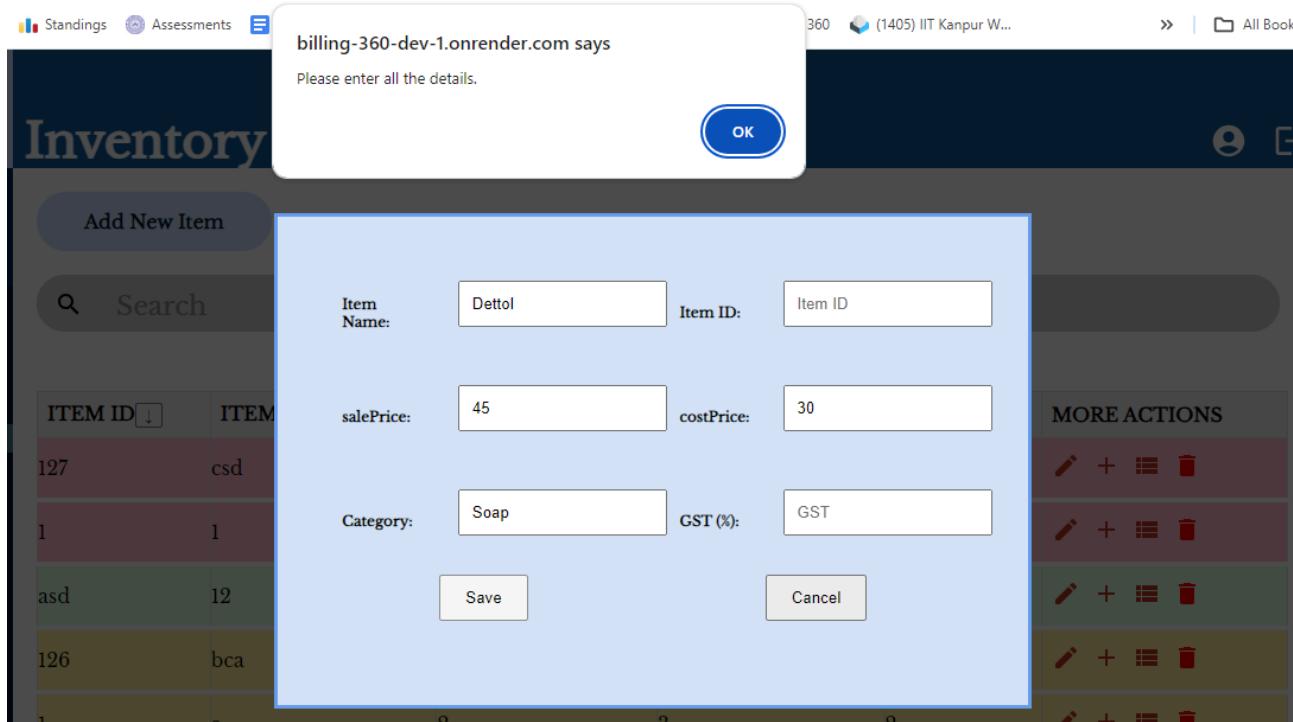
Result: Invalid characters are not added in the input space.

For Negative values message is generated asking to put non-negative value.



II) If not all details are entered.

Result: Message is displayed asking to enter all details



C) UpdateProduct:

In this unit, we have tested whether a product is getting updated correctly or not (backend testing).

Unit Details: [Item class, updateProduct() function].

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: updateProduct() function correctly updates the data related to a given product.

Structural Coverage: Functional coverage (covers the updateProduct() controller function).

POST <http://localhost:5050/api/inventory/update>

Body

```

1  {
2    "_id": "66041ddcf76121f7808d4103",
3    "itemID": "b",
4    "itemName": "a",
5    "salePrice": 100,
6    "costPrice": 69,
7    "itemGST": 2,
8    "category": "x",
9    "discount": 0,
10   "quantity": 10000180
11 }

```

Response

```

1  [
2    {
3      "_id": "66041ddcf76121f7808d4103",
4      "userID": "65f68027d9e504dee799d768",
5      "itemID": "b",
6      "itemName": "a",
7      "salePrice": 100,
8      "costPrice": 69,
9      "itemGST": 2,
10     "category": "x",
11     "discount": 0,
12     "quantity": 10000480,
13     "batchList": [
14       {
15         "batchID": "one",
16         "batchQty": 999980,
17         "expiryDate": "2024-04-06T00:00:00.000Z",
18         "_id": "66041df1f76121f7808d4106"
19       },
20       {
21         "batchID": "B1Blr",
22         "batchQty": 150,
23         "expiryDate": "2025-03-28T00:00:00.000Z",
24         "_id": "6605a1974b89302d6d09dc75"
25     }
26   ]
27 }

```

D) UpdateBatch:

In this unit, we have tested whether a batch is getting updated correctly or not (backend testing).

Unit Details: [Item class, UpdateBatch() function].

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: updateBatch() function correctly updates the data related to a given batch..

Structural Coverage: Functional coverage (covers the updateBatch() controller function).

POST <http://localhost:5050/api/inventory/updateBatch>

Body

```

1  {
2    "_idProduct": "66041ddcf76121f7808d4103" ,
3    "_id": "6605a1974b89302d6d09dc75" ,
4    "batchID": "B1Blr",
5    "batchQty": 200,
6    "expiryDate": "2025-03-28",
7    "initialBatchQty": 150
8  }

```

Response

```

1  [
2    {
3      "batchID": "one",
4      "batchQty": 999980,
5      "expiryDate": "2024-04-06T00:00:00.000Z",
6      "_id": "66041df1f76121f7808d4106"
7    },
8    {
9      "batchID": "B1Blr",
10     "batchQty": 200,
11     "expiryDate": "2025-03-28T00:00:00.000Z",
12     "_id": "6605a1974b89302d6d09dc75"
13   }
14 ]

```

D) View All Products

In this unit, we have tested whether the list of all products in a particular user's inventory is being extracted correctly from the database(backend testing).

Unit Details: [Item class, getAllProducts() function]

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: All products in the user's inventory are correctly listed.

Structural Coverage: Functional coverage(It covers the getAllProducts() controller function).

```

GET http://localhost:5050/api/inventory/get/65f68027d9e504de Send
Status: 200 OK Size: 942 Bytes Time: 61 ms

Response Headers 7 Cookies Results Docs { }

[{"batchID": "1", "category": "A", "discount": 0, "quantity": 100, "batchList": [{"batchID": "1", "category": "A", "discount": 0, "quantity": 100, "expiryDate": "2024-04-27T00:00:00Z"}, {"batchID": "1", "category": "A", "discount": 0, "quantity": 100, "expiryDate": "2024-04-27T00:00:00Z"}], "userID": "65f68027d9e504de", "itemID": "1", "itemname": "A", "itemprice": 100}, {"batchID": "2", "category": "B", "discount": 0, "quantity": 200, "batchList": [{"batchID": "2", "category": "B", "discount": 0, "quantity": 200, "expiryDate": "2024-04-27T00:00:00Z"}, {"batchID": "2", "category": "B", "discount": 0, "quantity": 200, "expiryDate": "2024-04-27T00:00:00Z"}], "userID": "65f68027d9e504de", "itemID": "2", "itemname": "B", "itemprice": 200}, {"batchID": "3", "category": "C", "discount": 0, "quantity": 300, "batchList": [{"batchID": "3", "category": "C", "discount": 0, "quantity": 300, "expiryDate": "2024-04-27T00:00:00Z"}, {"batchID": "3", "category": "C", "discount": 0, "quantity": 300, "expiryDate": "2024-04-27T00:00:00Z"}], "userID": "65f68027d9e504de", "itemID": "3", "itemname": "C", "itemprice": 300}, {"batchID": "4", "category": "D", "discount": 0, "quantity": 400, "batchList": [{"batchID": "4", "category": "D", "discount": 0, "quantity": 400, "expiryDate": "2024-04-27T00:00:00Z"}, {"batchID": "4", "category": "D", "discount": 0, "quantity": 400, "expiryDate": "2024-04-27T00:00:00Z"}], "userID": "65f68027d9e504de", "itemID": "4", "itemname": "D", "itemprice": 400}
    
```

E) Delete batch:

In this unit, we have tested whether a batch is getting deleted from the database correctly (backend testing).

Unit Details: [Item class, deleteBatch() function].

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: The selected batch is correctly deleted.

Structural Coverage: Functional coverage (covers the deleteBatch() controller function).

The screenshot shows a POST request to `http://localhost:5050/api/inventory/deleteBatch/66041ddcf76121f7808d4103/660`. The Headers tab is selected, showing the following configuration:

- Accept**: `/*`
- User-Agent**: Thunder Client (<https://www.thunderclient.com>)
- Content-Type**: `application/json`
- header**: value

The Response tab shows the following JSON output:

```

1  {
2    "_id": "66041ddcf76121f7808d4103",
3    "userID": "65f68027d9e504dee799d768",
4    "itemID": "b",
5    "itemName": "a",
6    "salePrice": 100,
7    "costPrice": 65,
8    "itemGST": 1,
9    "category": "x",
10   "discount": 0,
11   "quantity": 670,
12   "batchList": [
13     {
14       "batchID": "12",
15       "batchQty": 670,
16       "expirydate": "2024-04-05T00:00:00.000Z",
17       "_id": "6605ae4ea9437482ae23e56a"
18     }
19   ],
20   "_v": 4
21 }

```

F) Delete Product:

In this unit, we have tested whether the selected product is getting deleted from the database correctly (backend testing).

Unit Details: [Item class, deleteProduct() function].

Test Owner: Venkatesh

Test Date: 27-03-2024

Test Results: Selected Product is correctly deleted.

Structural Coverage: Functional coverage (covers the deleteProduct() function).

The screenshot shows the Thunder Client interface. On the left, the 'Headers' tab is selected, displaying the following configuration:

- Accept**: `/*`
- User-Agent**: `Thunder Client (https://www.thunderclient.com)`
- Content-Type**: `application/json`
- header**: `value`

On the right, the response details are shown:

Status: 200 OK Size: 56 Bytes Time: 90 ms

Response

```

1  {
2   "deleteProduct": {
3     "acknowledged": true,
4     "deletedCount": 1
5   }
6 }
```

Buttons at the bottom include 'Copy', 'Response', 'Chart', and a refresh icon.

G) Sorting

In this unit, we have tested the sorting feature (frontend testing).

Unit Details: [Item class, sortProducts() function].

Test Owner: Nipun

Test Date: 28/03/2024

Test Results: Items were displayed correctly based on the chosen field and in the chosen order.

Structural Coverage: Functional coverage (covers the implementation of sorting using the `sort()` method along with states `sortBy`, `sortDirection` and `sortedProducts` in the Inventory component's `sortProducts()` function). Two examples are shown below:

- Sorting in decreasing order of stock

The screenshot shows the Billing 360 application interface. On the left is a dark sidebar with user information (Infinity HI12F412) and navigation links: Dashboard, Invoice, **Inventory**, Pending Transactions, Transaction History, Reports, FAQs, and Contact Us. The main area is titled "Inventory" and contains a search bar. A table lists six items with columns: ITEM ID, ITEM NAME, SALE PRICE, COST PRICE, STOCK, and MORE ACTIONS. The items are color-coded: row 1 (abd) is green, rows 2 (csd), 3 (acd), and 5 (bca) are yellow, and rows 4 (bca) and 6 (abc) are green. The table header has sorting arrows for all columns except STOCK.

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
124	abd	12	10	786	
127	csd	18	16	564	
125	acd	14	12	243	
126	bca	11	10	24	
123	abc	10	9	10	

ii) Sorting in increasing order of sale price

This screenshot shows the same Billing 360 application interface as the previous one, but the items are now sorted by sale price in ascending order. The color coding remains the same: green for abc (row 1), yellow for bca (row 2), green for abd (row 3), yellow for acd (row 4), and yellow for csd (row 5). The table header still has sorting arrows for all columns except STOCK.

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
123	abc	10	9	10	
126	bca	11	10	24	
124	abd	12	10	786	
125	acd	14	12	243	
127	csd	18	16	564	

H) Colour coding of items based on expiry date

In this unit, we have tested whether the items are color coded according to expiry dates(red for expired, yellow for near expiry (expires after 3 days), green for fresh) (frontend testing).

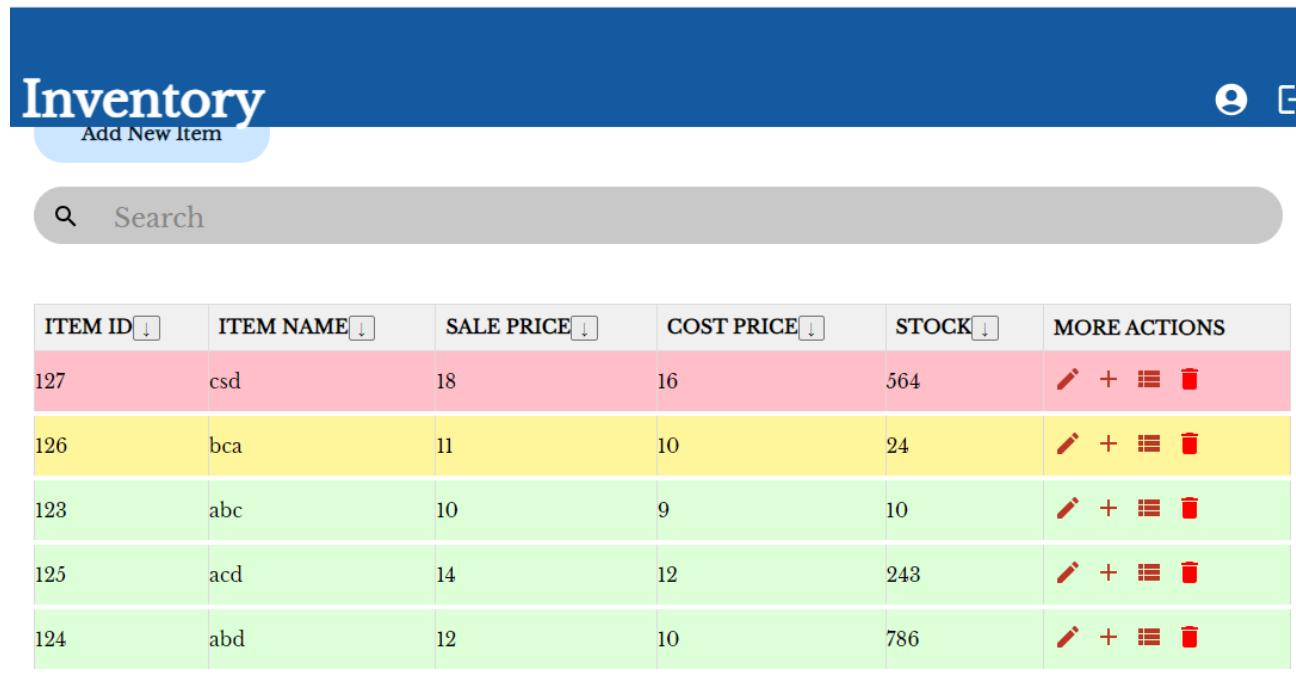
Unit Details: [Item class, getRowStyle() function]

Test Owner: Nipun

Test Date: 27-03-2024

Test Results: Products are correctly color coded according to the expiry date.

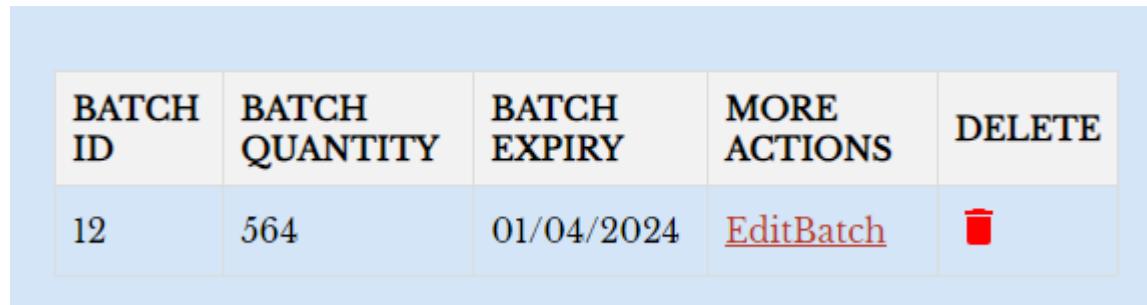
Structural Coverage: Functional coverage (covers the getRowStyle() function within the Inventory component in the frontend).



The screenshot shows a web-based inventory management system. At the top, there is a blue header bar with the word "Inventory" in white. Below the header is a search bar with a magnifying glass icon and the placeholder text "Search". A button labeled "Add New Item" is located in the top right corner. The main content area displays a table of items. The table has columns for Item ID, Item Name, Sale Price, Cost Price, Stock, and More Actions. The rows are color-coded: the first row (Item ID 127) is pink, the second (126) is yellow, the third (123) is light green, the fourth (125) is medium green, and the fifth (124) is light green. Each row contains a set of icons in the "More Actions" column: a red pencil, a plus sign, a grid, and a trash can.

ITEM ID ↓	ITEM NAME ↓	SALE PRICE ↓	COST PRICE ↓	STOCK ↓	MORE ACTIONS
127	csd	18	16	564	   
126	bca	11	10	24	   
123	abc	10	9	10	   
125	acd	14	12	243	   
124	abd	12	10	786	   

Batches of items displayed above:



The screenshot shows a modal dialog box with a light blue background. It contains a table with five columns: Batch ID, Batch Quantity, Batch Expiry, More Actions, and Delete. There is one row in the table, which corresponds to the data shown in the previous screenshot's table. The "Batch ID" column contains "12", the "Batch Quantity" column contains "564", the "Batch Expiry" column contains "01/04/2024", the "More Actions" column contains a link "EditBatch", and the "Delete" column contains a red trash can icon.

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
12	564	01/04/2024	EditBatch	

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
12	24	02/04/2024	EditBatch	

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
1	10	06/04/2024	EditBatch	

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
29	243	25/04/2024	EditBatch	

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
123	786	26/04/2024	EditBatch	

I) Search:

In this unit, we have tested whether the search bar works correctly(frontend testing)

Unit Details: [searchInput, setSearchInput]

Test Owner: Nipun

Test Date: 27-03-2024

Test Results: Search bar outputs all items corresponding to search parameters.

Structural Coverage: Functional coverage (covers the setSearchInput() function within the Inventory component in the frontend).

Search

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
127	csd	18	16	564	
126	bca	11	10	24	
123	abc	10	9	10	
125	acd	14	12	243	
124	abd	12	10	786	

Qab

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
123	abc	10	9	10	
124	abd	12	10	786	

8. Reports and Charts

(a) Backend testing:

In this unit, we have tested the fetching of invoices generated within a specified time period, which would be used by the frontend to generate reports.

Unit Details: [Invoice class, getSalesData() function, getInvoiceCount, getAllInvoice, searchInvoice, getSalesData controller functions].

Test Owner: Nipun

Test Date: 28/03/2024

Test Results: Invoices were extracted from the database correctly.

Structural Coverage: Functional coverage (covers the getSalesData(), getInvoiceCount, getAllInvoice, searchInvoice, getSalesData controller functions).

The screenshot shows a POSTMAN interface with a request to 'http://localhost:3001/invoice/sales/65f68027d9e504dee799d768?startDate=2024-03-16&endDate=2024-03-31'. The 'Query' tab is selected, displaying 'startDate' (2024-03-16) and 'endDate' (2024-03-31). The 'Response' tab shows a JSON object representing an invoice record with fields like id, userID, invoiceID, customerName, phoneNo, customerEmail, totalAmount, paymentMode, discount, itemlist, createdAt, totalCostPrice, totalSales, and __v.

```

{
  "id": "65f846f146260a3b1350e620",
  "userID": "65f68027d9e504dee799d768",
  "invoiceID": 30,
  "customerName": "x",
  "phoneNo": "x",
  "customerEmail": "saagarkopparam@gmail.com",
  "totalAmount": 13,
  "paymentMode": "Amount added to credit",
  "discount": 0,
  "itemlist": [],
  "createdAt": "2024-03-18T19:19:23.804Z",
  "totalCostPrice": 0,
  "totalSales": 0,
  "__v": 0
},
{
  "_id": "65f8474846260a3b1350e630",
  "userID": "65f68027d9e504dee799d768",
  "invoiceID": 31,
  "customerName": "s",
  "phoneNo": "s",
  "customerEmail": "saagarkopparam@gmail.com",
  "totalAmount": 45,
  ...
}

```

(b) Frontend testing:

In this unit, we have tested the frontend of the reports section and the display of charts within it (frontend testing).

Unit Details: [Reports class, Reports() component]

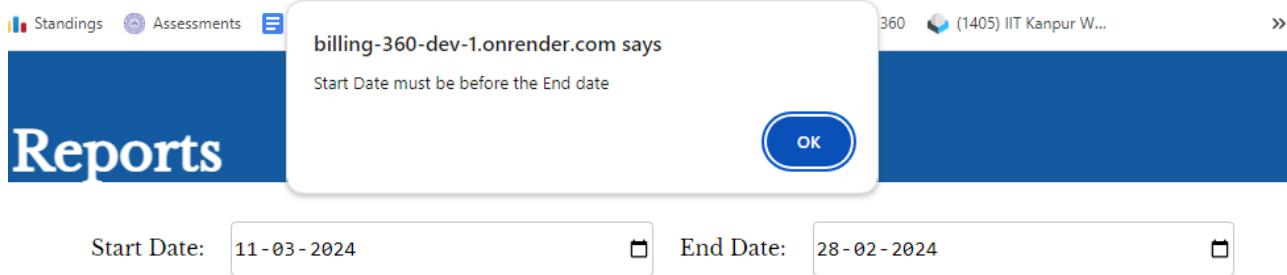
Test Owner: Nipun

Test Date: 27-03-2024

Test Results: The start date and end date were input as expected along with the check that confirms start date \leq end date. Information like total sales, total profit etc was calculated correctly from invoice data and charts were displayed correctly using this information.

Structural Coverage: Covers the Reports() component and various components corresponding to different types of charts, present in the Charts folder.

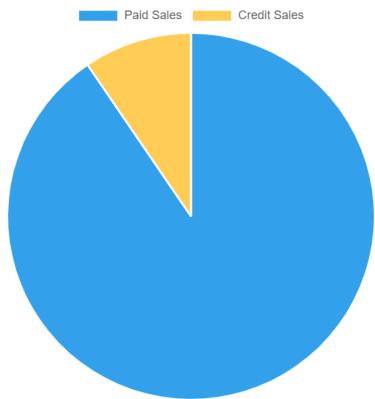
- i) When start date is after end date



ii) When start and end date are entered correctly.



Sales Distribution



Top 5 Customers by Sales

Name	Email	Total Sales
Saagar	saagarkv2005@gmail.com	800
Saagar	saagarkopparam@gmail.com	300
xyz	a	200
qq	q	200
Venkatesh	akulav@gmail.com	200

Additional Comments: The graphs displayed in the dashboard are also similar. The code generating those graphs was also tested and was found to be correct.

3. Integration Testing

Integration testing involves testing whether the backend and frontend interact the right way and produce the desired behaviour. Both backend and frontend units have been individually tested by the unit testing team. We have performed integration testing as follows. We gave the input to the frontend and observed final changes that occur after the backend processes the request sent by the frontend. Correct final behaviour implies that the interaction between backend and frontend was alright. Apart from this, integration testing also involves the interaction between different components, redirection of pages and updation of pages whenever a change is made to the database from anywhere.

1. Authentication

Module Details: The module encompasses testing procedures for user registration through OTP verification, login for already registered users, and the forgot password feature. Additionally, it includes validating the redirection to respective pages upon completion of these actions.

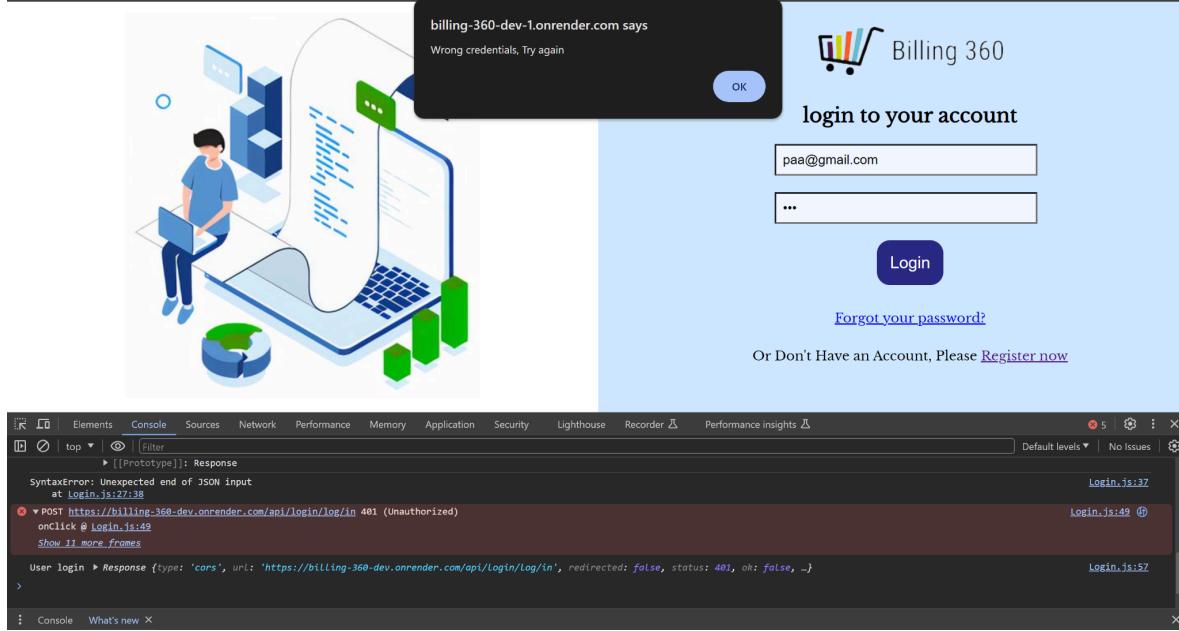
Test Owner: Poojal Katiyar

Test Date: 25/03/2024

Test Results: In this test we validated the successful integration of backend and frontend components of SignUp, Login, Email Verification and Forgot password feature. We also validated that database is updated on registration of new user and password is stored in encrypted format to maintain the security of the user. Here we are integrating login api, Sign Up api, Forgot Password api and generate otp api using frontend. Throughout the testing process, we also scrutinized the redirection of users to the correct pages upon the completion of these actions.

TEST #1:

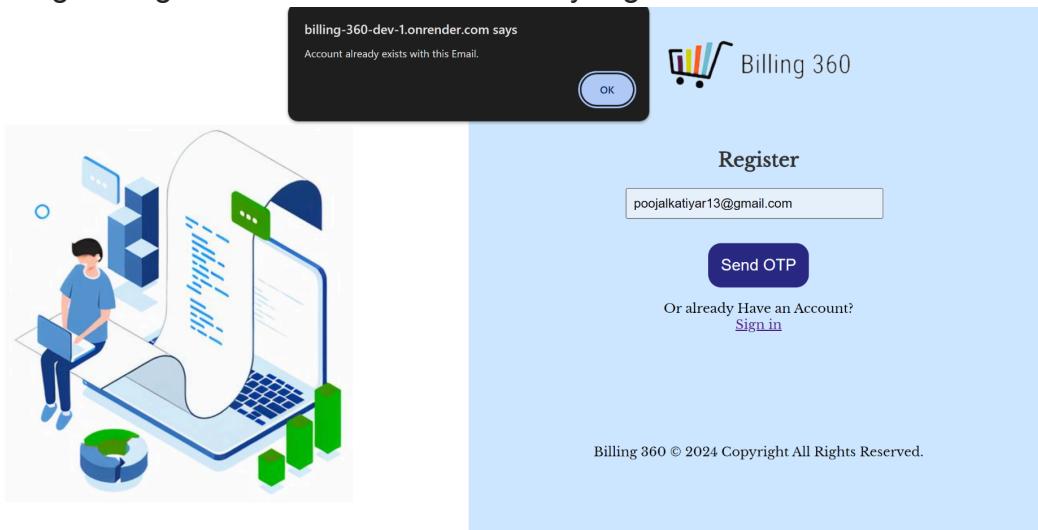
Details: Invalid credentials entered while trying to login.



Result: Pop-up displaying that entered credentials are invalid. Login is denied.

TEST #2:

Details: Registering for an email which is already registered on the site.

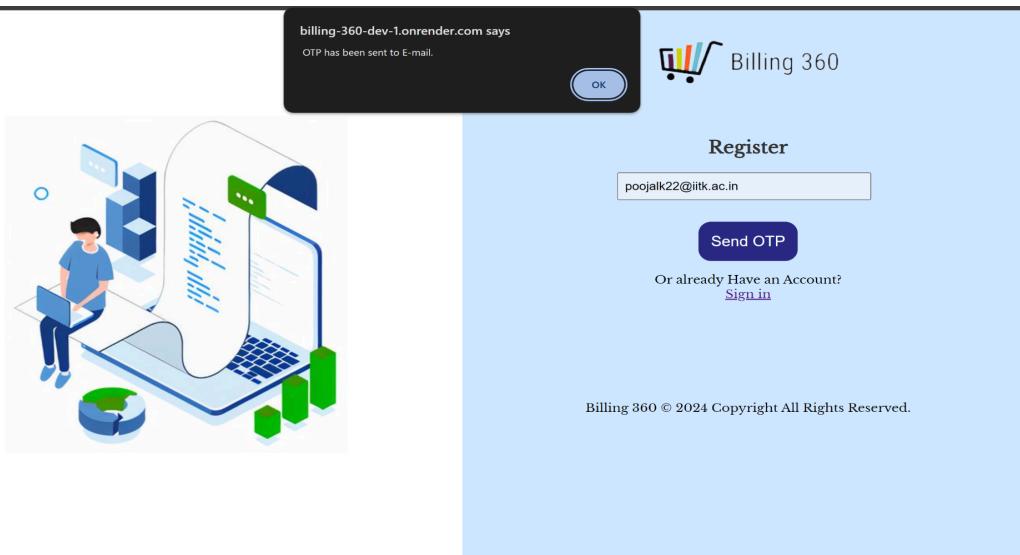


Result: Popup showing "Account already exists with this Email."

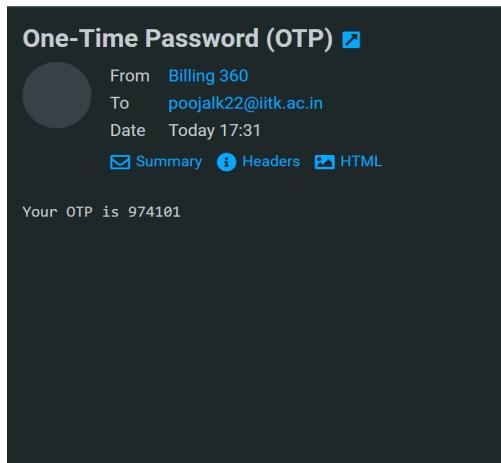
TEST #3:

Details: OTP Verification and registration of a new user.

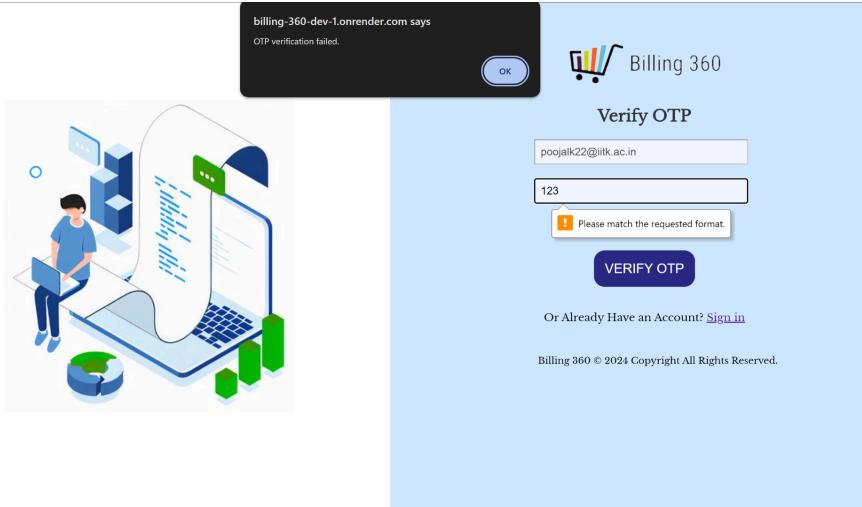
Flow: Email Entered in Register Page->OTP mailed->Directed to Verify OTP page->Directed to fill details Page where user registers himself with details->User Directed back to login page after registering successfully and user's data updated in MongoDB database



Mail sent for otp verification:



When otp entered does not matches with the sent otp:

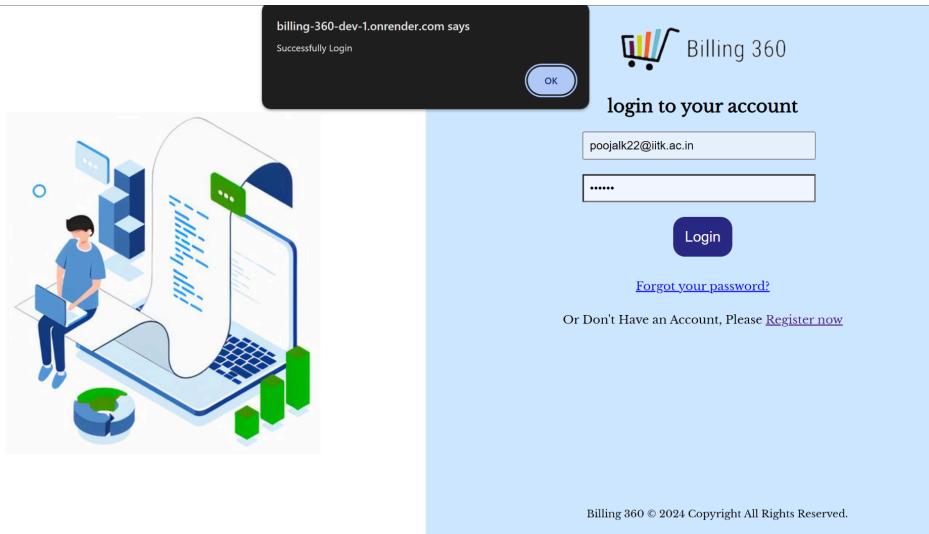


New User is updated in MongoDB Database, upon entering correct details and OTP.

Result: Finally when a new user enters everything correctly as described above he/she is successfully registered and ready to login.

TEST #5:

Details: Login with right credentials.



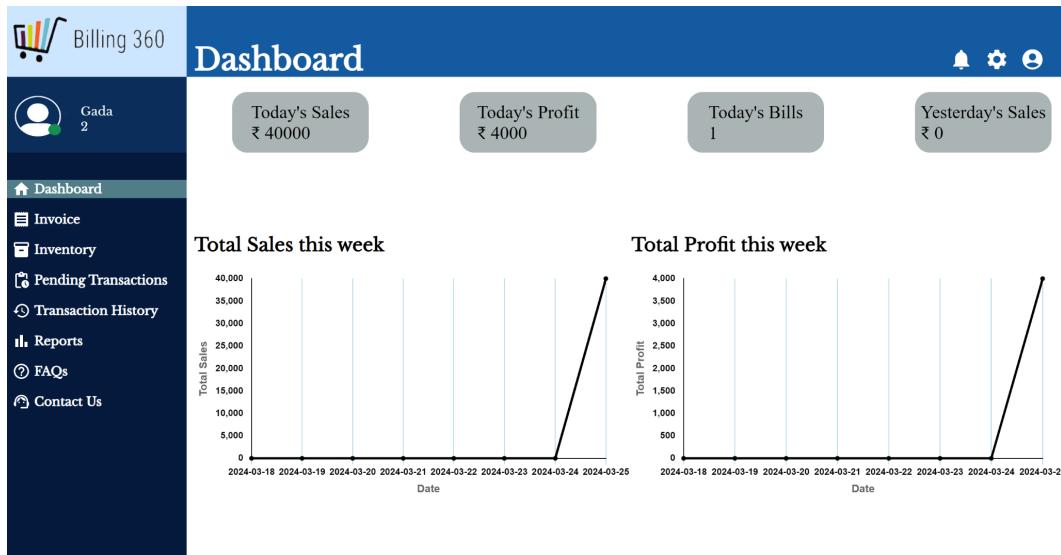
Frontend Console request for login :

```
▼ Response {type: 'cors', url: 'https://billing-360-dev.onrender.com/api/user/get/660169a44cebeb3182de5d6e', redirected: false, status: 200, ok: true, ...} ⓘ
  body: {...}
  bodyUsed: true
  ▶ headers: Headers {}
  ok: true
  redirected: false
  status: 200
  statusText: ""
  type: "cors"
  url: "https://billing-360-dev.onrender.com/api/user/get/660169a44cebeb3182de5d6e"
  ▶ [[Prototype]]: Response
>
  ...
  ▶ Console What's new X
```

Backend Console which prints the user object :

```
{
  _id: new ObjectId('660169a44cebeb3182de5d6e'),
  firstname: 'Pooja',
  lastname: 'Katiyar',
  email: 'poojalk22@iitk.ac.in',
  password: '$2b$10$rPdqPam0trOFd.InFhaVsOTxpRl4qHx0cAxns/lw.PATLXN9JMKwW',
  gstno: '2',
  shopname: 'Gada',
  shopaddress: 'NC 27, IFFCO Phulpur Township Allahā',
  phonenumer: '+918009259892',
  __v: 0
}
[]
today
```

After login user is directed to **Dashboard**



Frontend Console on logging into the site displays request to view on dashboard

```

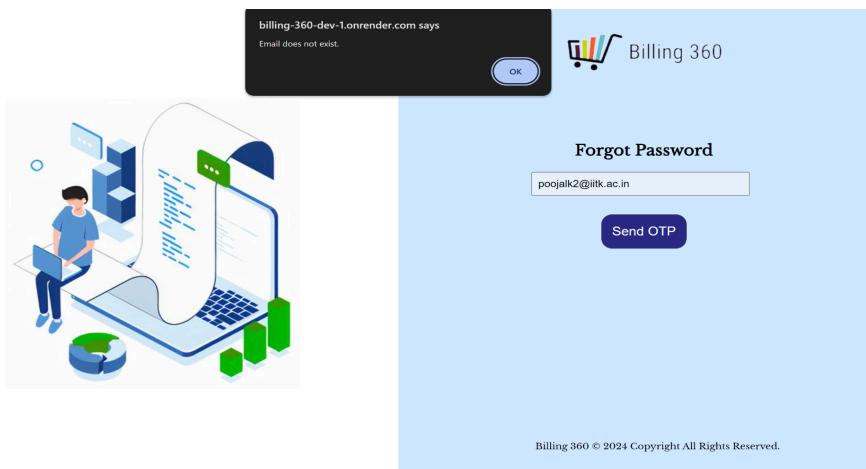
Object {  
  2024-03-18: 0  
  2024-03-19: 0  
  2024-03-20: 0  
  2024-03-21: 0  
  2024-03-22: 0  
  2024-03-23: 0  
  2024-03-24: 0  
  2024-03-25: 40000  
} [Prototype] Object  
Object {  
  "2024-03-25": 40000  
} [Prototype] Object  
Object {  
  numberofInvoices: 1  
  totalCostPrice: 36000  
  totalSellingPrice: 40000  
  totalSellingPriceYesterday: 0  
} [Prototype] Object

```

Console What's new X

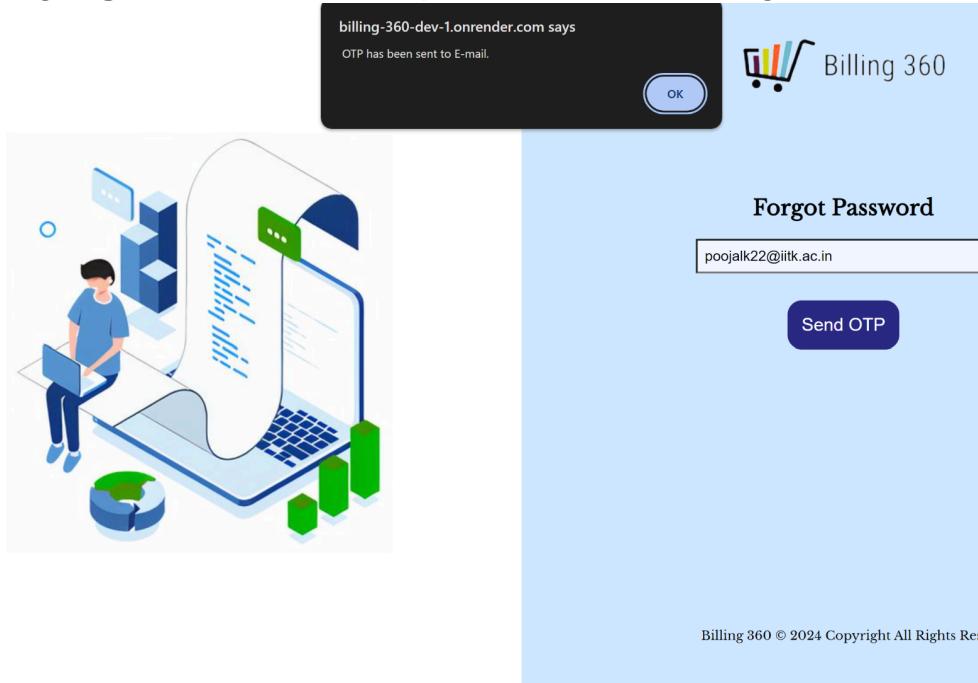
TEST #6:

Details: To verify the feature of forgot password and to check if the password is updated correctly.

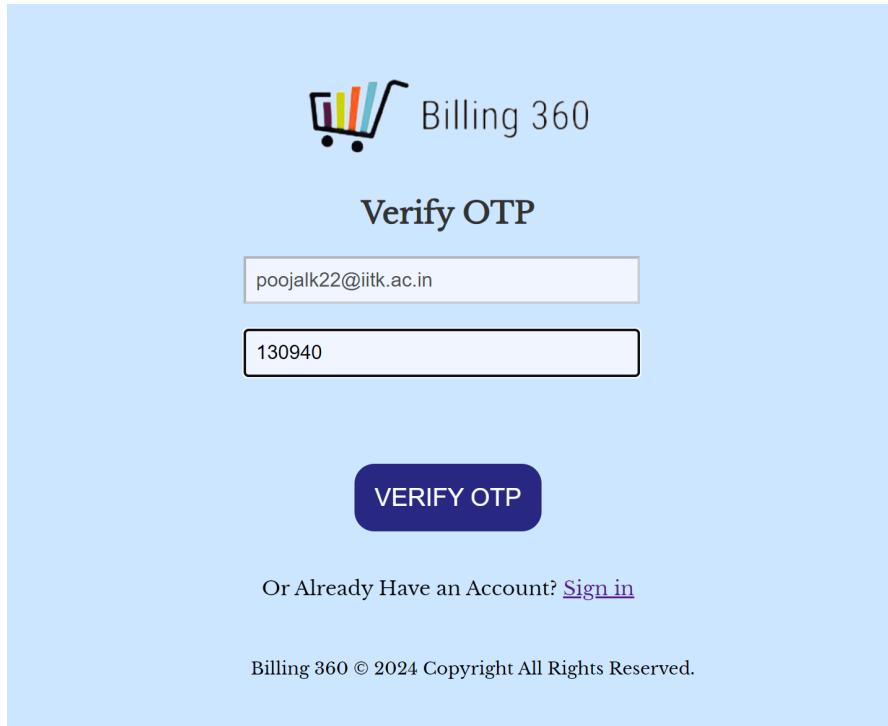


Result: Pop up box which displays “Email does not exist”

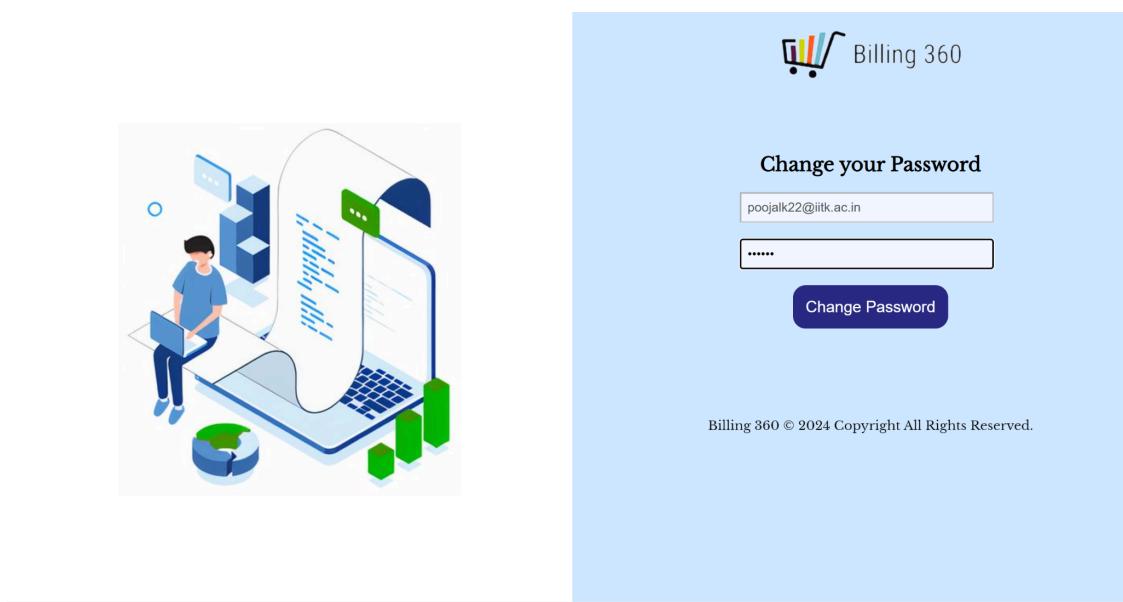
On entering **registered email-ID otp** will be sent to the registered email



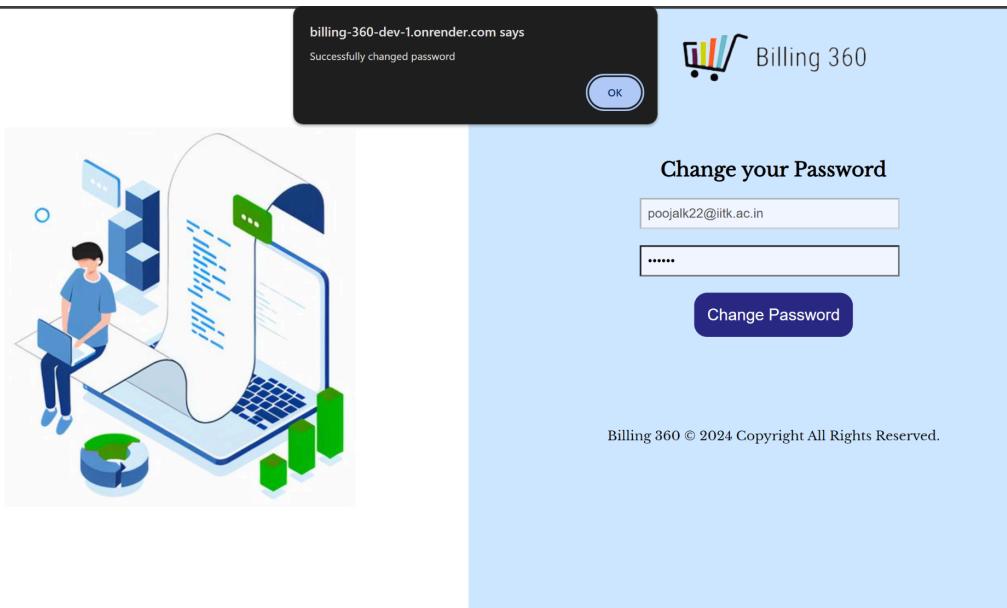
Result :OTP sent to the email will be entered and on clicking verify OTP will be directed to change your password page.



Change your password page:

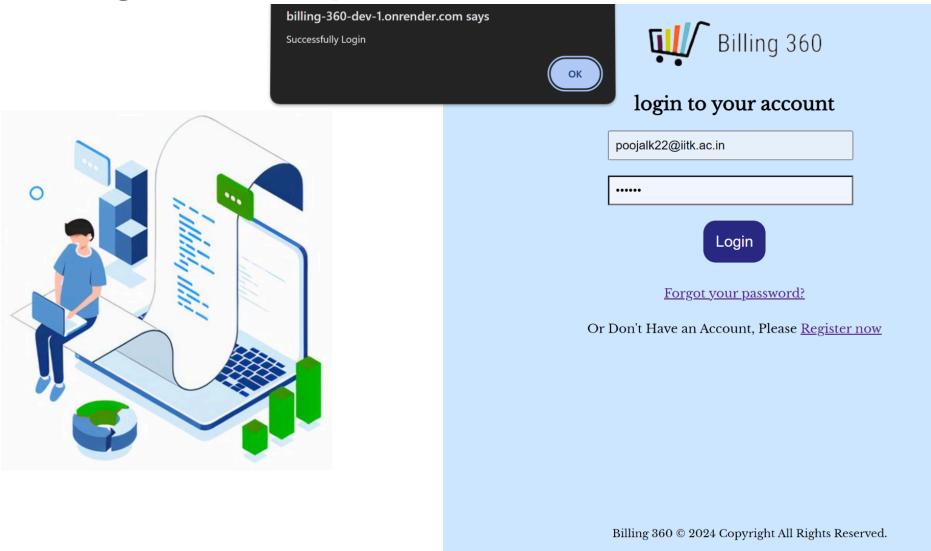


Result: After Entering new password pop up box which says password changed successfully.



Result: On clicking OK will be directed again to login page and now I can login with a new password.

Successful login with new password:



2. Inventory

Module Details: The module encompasses testing procedures for inventory management specific to a particular user which includes api calls for getting the data of all the products, adding a new item, updating and deleting an existing item in the inventory. Additionally, it also includes viewing all the batches of a particular item, adding a batch, editing and deleting an existing batch of an item.

Test Owner : Abhishek Khandelwal

Test Date : 25/03/2024

Test Results : In this test we validated the successful integration of backend and frontend components of getAllProducts, addProduct, updateProduct, viewBatch, updateBatch and delete(Batch/item). Apart from this, we successfully tested that the stock field in the inventory page represents the correct total items over all the batches after all kinds of modifications. Throughout the testing process, we also scrutinized the redirection of users to the correct pages upon the completion of these actions.

Test #1

Details : To verify whether all the products in the inventory of a particular user are fetched correctly or not.

Searching for all the products of the authorised user in the database for verification.

test.inventories

STORAGE SIZE: 44KB LOGICAL DATA SIZE: 20.52KB TOTAL DOCUMENTS: 78 INDEXES TOTAL SIZE: 36KB

[Find](#) [Indexes](#) [Schema Anti-Patterns \(0\)](#) [Aggregation](#) [Search Indexes](#) [INSERT DOCUMENT](#)

[Filter](#) {`userID : "65ec9d49a1da9d6fd4af865c"`} [Reset](#) [Apply](#) [Options ▾](#)

QUERY RESULTS: 1-5 OF 5

```

_id: ObjectId('65f3d0488d3b9f1b8bd65fe8')
userI...: "65ec9d49a1da9d6fd4af865c"
itemI...: "1"
itemNam...: "Shampoo"
salePric...: 100
costPric...: 75
itemGS...: 10
categor...: "Cosmetic"
discoun...: 10
quantit...: 117
batchLis...: Array (1)
__...: 1
  
```

[... 78 DOCUMENTS FOUND](#)

Verifying whether the displayed data is in correspondence with the database data or not.

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
5	Classmate Notebook	100	80	0	
2	Soap	40	32	206	
1	Shampoo	100	75	117	
3	Namkeen	55	45	77	
4	Mobile Phone	10000	9000	104	

Result : Displaying all the products in the inventory with correct details of the user logged in.

Test #2

Details : To verify the feature of adding a new item in the inventory.

Adding a new product

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
5	Classmate Notebook	100	80	0	
2	Soap	40	32	206	
1	Shampoo	100	75	117	
3	Namkeen	55	45	77	
4	Mobile Phone	10000	9000	104	
6	Classmate Notebook	100	80	0	

Display of the new product in the inventory page verifying the addition in database.

The screenshot shows the 'Inventory' section of the Billing 360 application. On the left, a sidebar menu includes 'Dashboard', 'Invoice', 'Inventory' (which is selected and highlighted in blue), 'Pending Transactions', 'Transaction History', 'Reports', 'FAQs', and 'Contact Us'. The main area displays a table of inventory items with columns: ITEM ID, ITEM NAME, SALE PRICE, COST PRICE, STOCK, and MORE ACTIONS. The table contains five rows of data:

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
5	Classmate Notebook	100	80	0	
2	Soap	40	32	206	
1	Shampoo	100	75	117	
3	Namkeen	55	45	77	
4	Mobile Phone	10000	9000	104	

Result : The new item is successfully added into the inventory.

Test #3

Details : To verify the feature of adding a batch for an item in the inventory.

Adding a new batch

The image consists of two screenshots of the 'Add New Item' interface. The left screenshot shows a date picker for '02/02/2020'. The right screenshot shows a confirmation message: 'Batch ADDED' with 'Save' and 'Cancel' buttons.

Screenshot 1 (Left):

The 'Add New Item' form is displayed. It has fields for 'ITEM ID' (set to 1) and 'ITEM NAME' (set to 100). A date picker is open, showing the date '02/02/2020'. Below the date picker are buttons for 'Save' and 'Cancel'.

Screenshot 2 (Right):

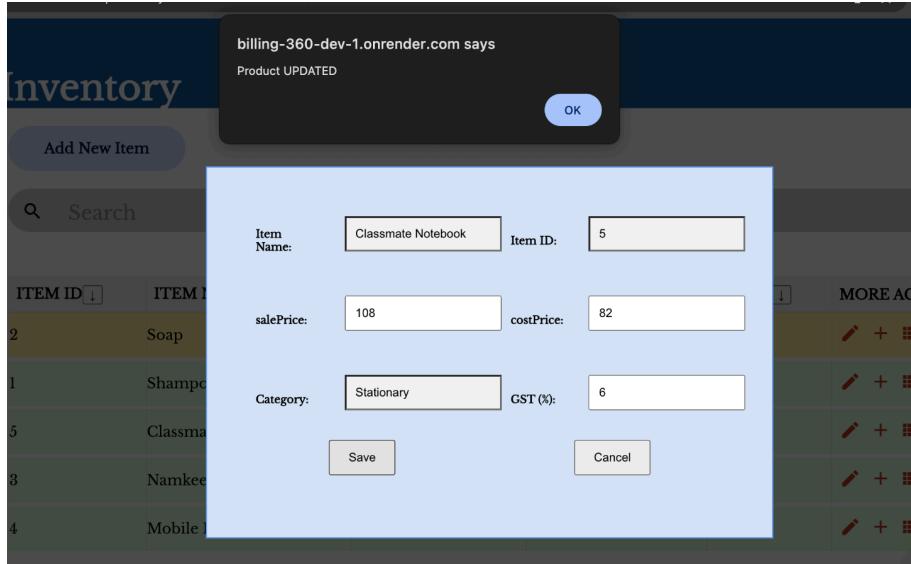
The 'Add New Item' form is shown again, but now it displays a message box with the text 'Batch ADDED'. There are 'Save' and 'Cancel' buttons at the bottom of the message box. The background table of items is visible, showing the same five items as the first screenshot.

Result : Batch is added successfully with a pop-up box confirming that.

Test #4

Details : To verify the feature of updating the details of an item in the inventory.

Pop-up box showing Product Updated after clicking on save button.



Updated information received from backend confirming the update in database.

Inventory						
Add New Item		Search				
ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS	
2	Soap	40	32	230		
1	Shampoo	100	75	125		
5	Classmate Notebook	108	82	200		
3	Namkeen	55	45	77		
4	Mobile Phone	10000	9000	106		

Result : The information is successfully updated via edit item feature.

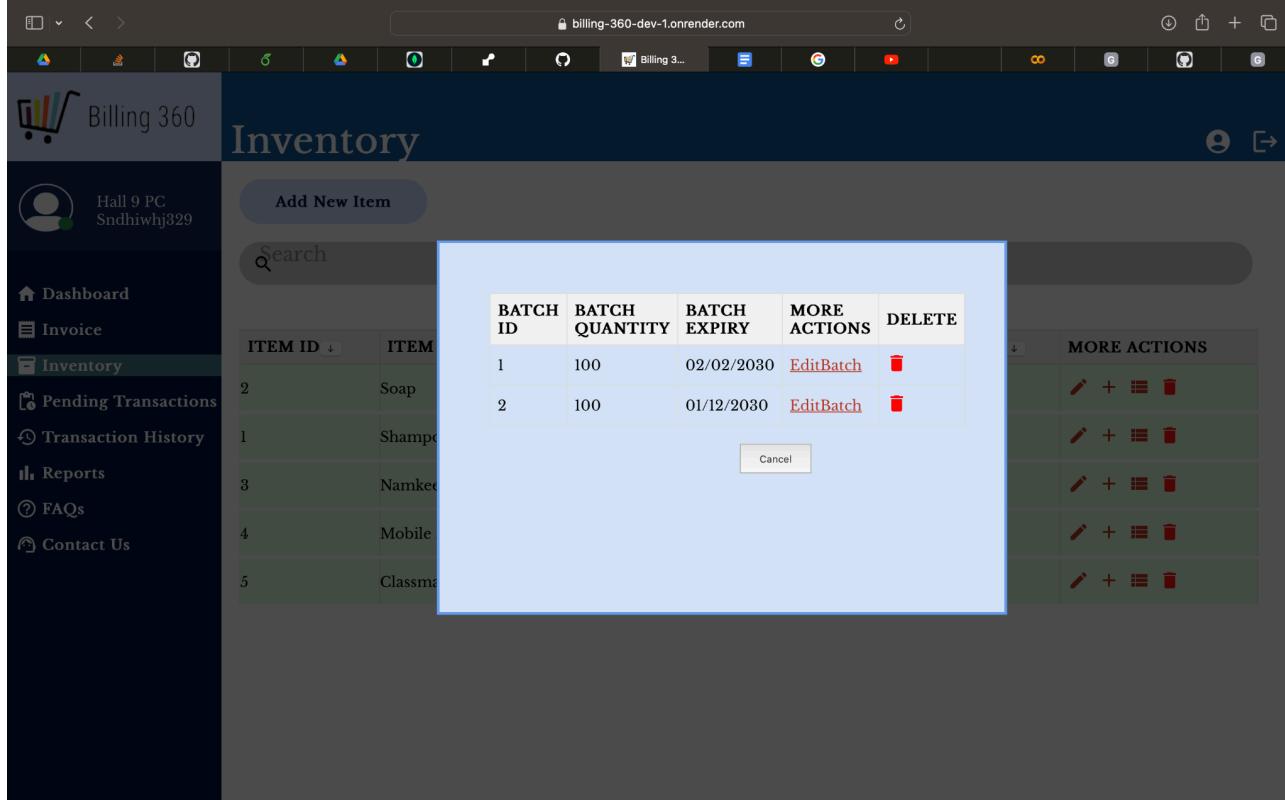
Test #5

Details : To verify the feature of viewing the details of a batch of a particular item.

Information of the batches of a particular item in the database.

```
_id: ObjectId('6601af76f4fbcd902d92f1a5')
userI...: "65ec9d49a1da9d6fd4af865c"
itemI...: "5"
itemNam...: "Classmate Notebook"
salePric...: 100
costPric...: 80
itemGS...: 6
categor...: "Stationary"
discoun...: 0
quantit...: 200
batchList...: Array (2)
  ▾ 0: Object
    batchI...: "1"
    batchQt...: 100
    expiryDate...: 2030-02-02T00:00:00.000+00:00
    _i...: ObjectId('66024a4baebade5cf730d78b')
  ▾ 1: Object
    batchI...: "2"
    batchQt...: 100
    expiryDate...: 2030-12-01T00:00:00.000+00:00
    _i...: ObjectId('66024a97aeade5cf730d795')
```

View Batch Dialog showing the correct data of the batches.

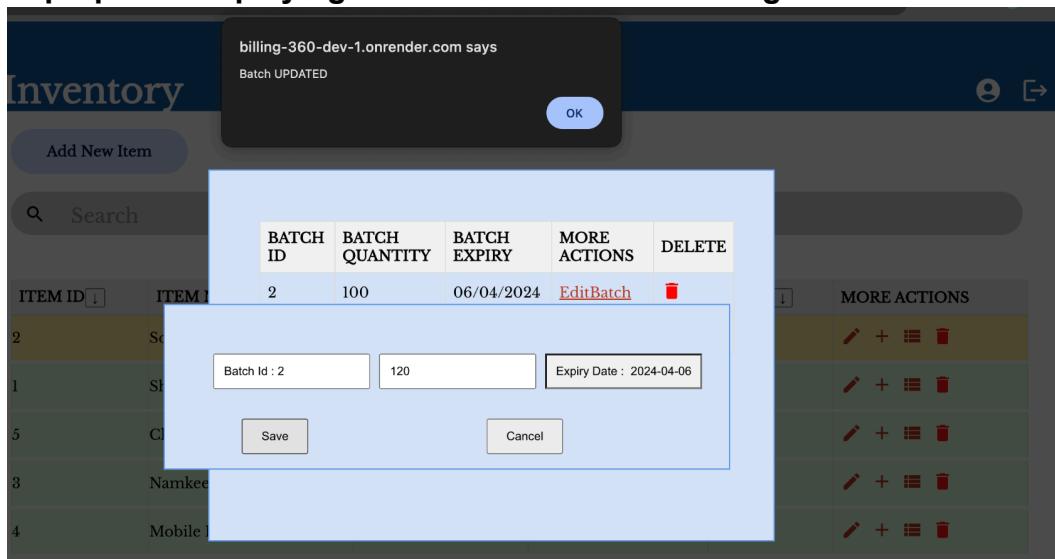


Result : The data of the view Batch dialog in frontend and corresponding data in database are matching.

Test #6

Details : To verify the feature of editing the details of a batch of a particular item.

Pop-up box displaying Batch UPDATED on clicking the save button.



Information correctly updated in the view Batch Dialog.

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
ITEM ID 2	120	06/04/2024	EditBatch	
1	100	17/02/2030	EditBatch	
5				
3				
4				

Stock successfully updated after editing the details of batch.

ITEM ID	ITEM NAME	SALE PRICE	COST PRICE	STOCK	MORE ACTIONS
2	Soap	40	32	230	
1	Shampoo	100	75	125	
5	Classmate Notebook	108	82	220	
3	Namkeen	55	45	77	
4	Mobile Phone	10000	9000	106	

Database confirming the update.

```

test.inventories
STORAGE SIZE: 44KB LOGICAL DATA SIZE: 22.71KB TOTAL DOCUMENTS: 86 INDEXES TOTAL SIZE: 36KB
Find Indexes Schema Anti-Patterns Aggregation Search Indexes INSERT DOCUMENT
Filter {userID : "65ec9d49a1da9d6fd4af865c"} Reset Apply Options
{
  salePrice: 108,
  costPrice: 82,
  itemGst: 6,
  category: "Stationary",
  discount: 0,
  quantity: 220,
  batchList: [
    {
      batchID: "2",
      batchQty: 120,
      expiryDate: 2024-04-06T09:00:00.000+00:00
    },
    {
      batchID: "1",
      batchQty: 100,
      expiryDate: 2030-02-17T09:00:00.000+00:00
    }
  ],
  _id: ObjectId('6602c6bb8fe91813dd8bf68e')
}
  
```

Result : Batch details are successfully updated.

Test #7

Details : To verify the feature of deleting a batch of a particular item.

Current Batch data

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
2	120	06/04/2024	EditBatch	
1	100	17/02/2030	EditBatch	

Cancel

Deleting Batch with batch Id 2.

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
2				
1				

Are you sure you want to delete this batch?

Dialog box successfully updated.

BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
1	100	17/02/2030	EditBatch	

Cancel

Both the batch data and total stock successfully updated in the database.

test.inventories

STORAGE SIZE: 44KB LOGICAL DATA SIZE: 22.63KB TOTAL DOCUMENTS: 86 INDEXES TOTAL SIZE: 36KB

[Find](#) [Indexes](#) [Schema Anti-Patterns](#) [Aggregation](#) [Search Indexes](#)

[INSERT DOCUMENT](#)

Filter [Reset](#) [Apply](#) [Options](#)

```

_id: ObjectId('6601af76f4fb902d92f1a5')
userId: "65ec9d49a1da9d6fd4af865c"
itemL: "5"
itemName: "Classmate Notebook"
salePric.: 108
costPric.: 82
itemG5.: 6
category: "Stationary"
discoun.: 0
quantit.: 100
batchList: Array (1)
  ▾ 0: Object
    batchI: "1"
    batchQl: 100
    expiryDate: 2030-02-17T00:00:00.000+00:00
    _i: ObjectId('6602a9d9ca0cf87e0de8ea6a')
  ▾ _n: 3

```

Result : The batch deletion is verified successfully.

Test #8

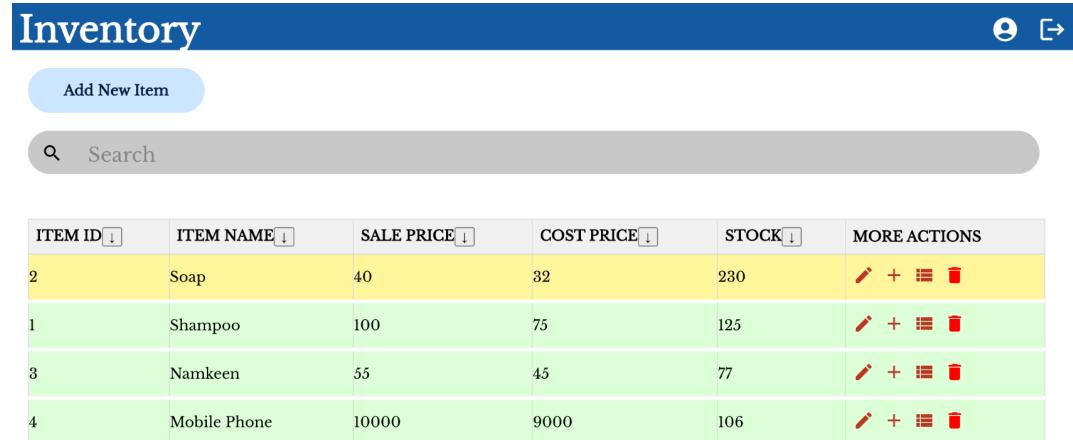
Details : To verify the feature of deleting an item from inventory.

Initial state before delete operation on “Classmate Notebook”.



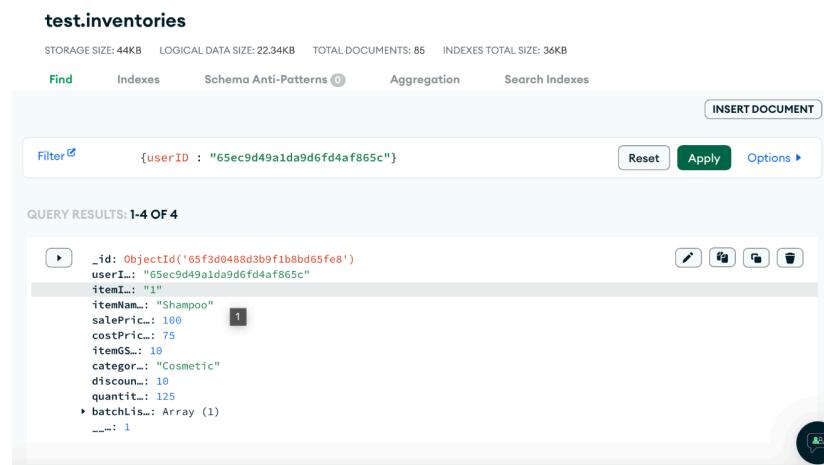
ITEM ID ↓	ITEM NAME ↓	SALE PRICE ↓	COST PRICE ↓	STOCK ↓	MORE ACTIONS
2	Soap	40	32	230	
1	Shampoo	100	75	125	
3	Namkeen	55	45	77	
4	Mobile Phone	10000	9000	106	
5	Classmate Notebook	108	82	100	

State after pressing delete icon in the row corresponding to “Classmate Notebook”



ITEM ID ↓	ITEM NAME ↓	SALE PRICE ↓	COST PRICE ↓	STOCK ↓	MORE ACTIONS
2	Soap	40	32	230	
1	Shampoo	100	75	125	
3	Namkeen	55	45	77	
4	Mobile Phone	10000	9000	106	

Database successfully updated.



test.inventories

STORAGE SIZE: 44KB LOGICAL DATA SIZE: 22.34KB TOTAL DOCUMENTS: 85 INDEXES TOTAL SIZE: 36KB

Find Indexes Schema Anti-Patterns Aggregation Search Indexes

INSERT DOCUMENT

Filter {userID : "65ec9d49a1da9d6fd4af865c"} Reset Apply Options

QUERY RESULTS: 1-4 OF 4

```

_id: ObjectId("65f3d0488d3b9f1b8bd65fe8")
userI.: "65ec9d49a1da9d6fd4af865c"
itemI.: "1"
itemNm.: "Shampoo"
salePric.: 100
costPric.: 75
itemGc.: 10
categor.: "Cosmetic"
discount.: 10
quantit.: 125
batchLis.: Array (1)
__v: 1
  
```

Result : Successful verification of deleting an item feature from inventory.

3 Pending Transactions

Module Details: Ensure the seamless functionality of the invoicing system across various modules, including invoice creation, automatic email notifications for credit additions and payments, and updating customers via email. Additionally, validate the proper api calls to edit customer information, manual debit/credit additions, invoice generation and transaction history updates

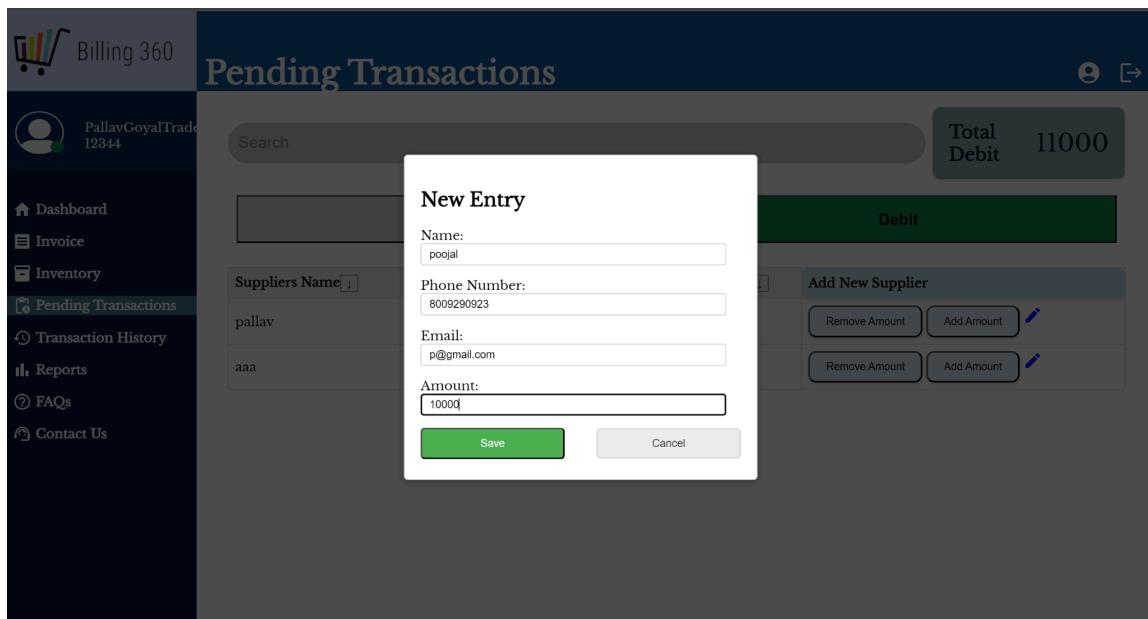
Test Owner : Poojal Katiyar

Test Date : 26/03/2023

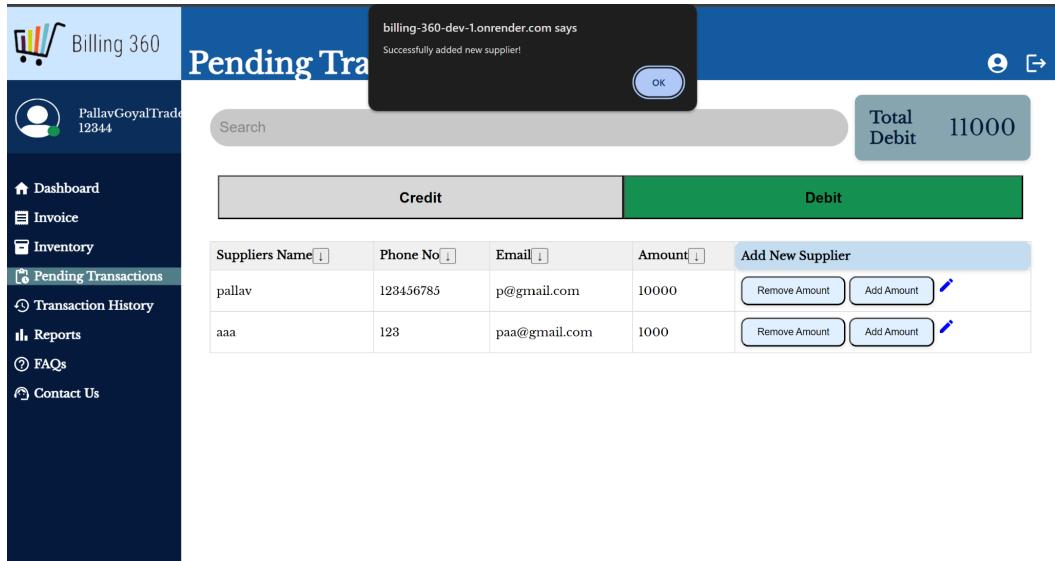
Test Results : In this test we validated the successful integration of backend and frontend components of Add new customer/Supplier, Update entry ,Clear dues,Add as credit ,generating invoices on clear dues/Add as Credit and sending it to the customer via email.Apart from this successfully tested that entered amount for clear dues does not exceed the due amount or negative amount is entered.Throughout the testing process, we also scrutinized the redirection of users to the correct pages upon the completion of these actions.

Test #1

Details : To verify the proper functioning of Add New Supplier in the Debit tab.



Result: Add new Supplier dialog box open in which details are entered.



Result: Suppliers name is updated in the table

					Total Debit 21000
Credit			Debit		
Suppliers Name	Phone No	Email	Amount	Add New Supplier	
pallav	123456785	p@gmail.com	10000	<button>Remove Amount</button> <button>Add Amount</button>	↗
poojal	8009123456	pallav@gmal.com	10000	<button>Remove Amount</button> <button>Add Amount</button>	↗
aaa	123	paa@gmail.com	1000	<button>Remove Amount</button> <button>Add Amount</button>	↗

Test #2

Details :On Adding New Customer ,Invoice is generated regarding how much amount is due by customer, new customer is added in the database and pdf is mailed to Customer's Email.

Pending Transactions

Total Credit 9

CustomerName	Phone No	Email	Amount	Add New Customer
pallav	9	p	11.09999999999994	<button>Clear Dues</button> <button>Add to Credit</button>
anya	35576889	anya@gmail.com	99588.5	<button>Clear Dues</button> <button>Add to Credit</button>

New Entry

Name: pallav

Phone Number: 234567897

Email: poojalk22@gmail.com

Amount: 1000

Debit

Add New Customer

Clear Dues **Add to Credit**

Clear Dues **Add to Credit**

Invoice Added popup Box

Pending Transactions

billing-360-dev-1.onrender.com says

Invoice ADDED

OK

Total Credit 9959

CustomerName	Phone No	Email	Amount	Add New Customer
pallav	9	p	11.09999999999994	<button>Clear Dues</button> <button>Add to Credit</button>
anya	35576889	anya@gmail.com	99588.5	<button>Clear Dues</button> <button>Add to Credit</button>

Database of Customers is updated

```

_id: ObjectId('6602ef627183aa864feccbe8')
userID: "65f3507fc86c4fb597696653"
name: "pallav"
phoneNo: "234567897"
email: "poojalk22@gmail.com"
creditAmount: 1000
▼ invoiceList: Array (1)
  0: ObjectId('6602ef637183aa864feccbeb')
__v: 1

```

Invoice is generated and added to transaction history as “Amount added to Credit”

Transaction History

Search

DATE	CUSTOMER NAME	TYPE	AMOUNT	INVOICE
26/03/2024, 08:39 pm	pallav	Amount added to credit	1000	14
26/03/2024, 08:39 pm	poojal	Credit dues cleared	700	13
26/03/2024, 08:43 pm	khandelwal	Credit dues cleared	1980	12
26/03/2024, 12:12 am	pallav	Amount added to credit	10	11
26/03/2024, 12:12 am	poojal	Credit dues cleared	200	10
26/03/2024, 12:12 am	poojal	Credit dues cleared	100	9

Invoice PDF

PallavGoyalTraders

GST No. : 12344
 Address : NC 27,IFFCO Phulpur Township Allahabad
 Email: poojalkatiyar13@gmail.com
 Phone No.: undefined

Billed To:	Invoice ID #14
pallav	Created at: Tue, Mar 26, 2024, 03:09 PM
poojalk22@gmail.com	STATUS: Amount added to credit
234567897	

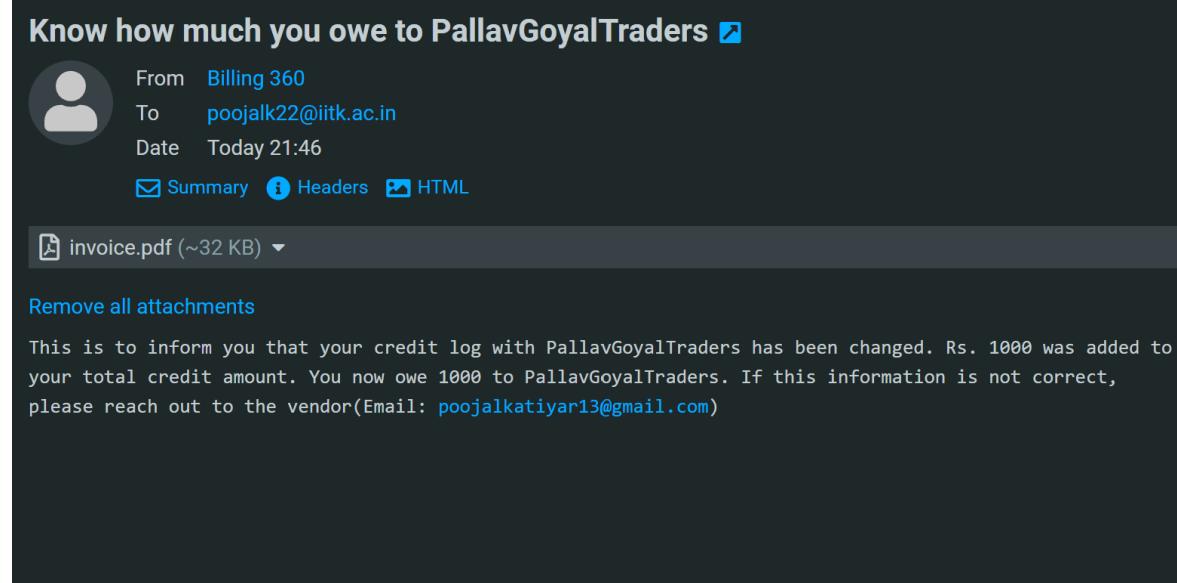
Summary

No.	Item	Price	GST (%)	Quantity	Total
				Sub Total :	₹ 0
				Discount :	- ₹ 0
				Grand Total :	₹ 1000

Customer Notes

undefined

PDF of invoice sent to customers's email



Test #3

Details :Clear Dues functionality

The screenshot shows a table of customer credit information. A modal window is open over the table, titled "Amount:" with a sub-instruction "Enter Amount:". Inside the modal is a text input field containing "100". Below the input field are two buttons: "Submit" (green) and "Cancel" (grey). The background table has columns for CustomerName, Phone, Email, and Balance. Each row contains a "Clear Dues" button and an edit icon. The total credit value "101834.44" is displayed at the top right.

Credit		Debit	
CustomerName	Phone	Email	Balance
pallav	9	poojalkatiyar13@gmail.com	1000
anya	85		284.84
poojal	1234567891	poojalkatiyar13@gmail.com	284.84
pallav	234567897	poojalk22@iitk.ac.in	1000
pallav	234567897	poojalk22@iitk.ac.in	1000

Total Credit: 101834.44

Mail Send to Customer regarding Amount paid to the Shopkeeper

Know how much you owe to PallavGoyalTraders ↗

From Billing 360
 To poojalk22@iitk.ac.in
 Date Today 22:02

Summary Headers HTML

 invoice.pdf (~32 KB) ▾

Remove all attachments

This is to inform you that your credit log with PallavGoyalTraders has been changed. You have paid Rs. 100. You now owe 900 to PallavGoyalTraders. If this information is not correct, please reach out to the vendor (Email: poojalkatiyar13@gmail.com)

DEVELOPMENT AND OPERATIONS: A new forum Regarding Software Testing is created.

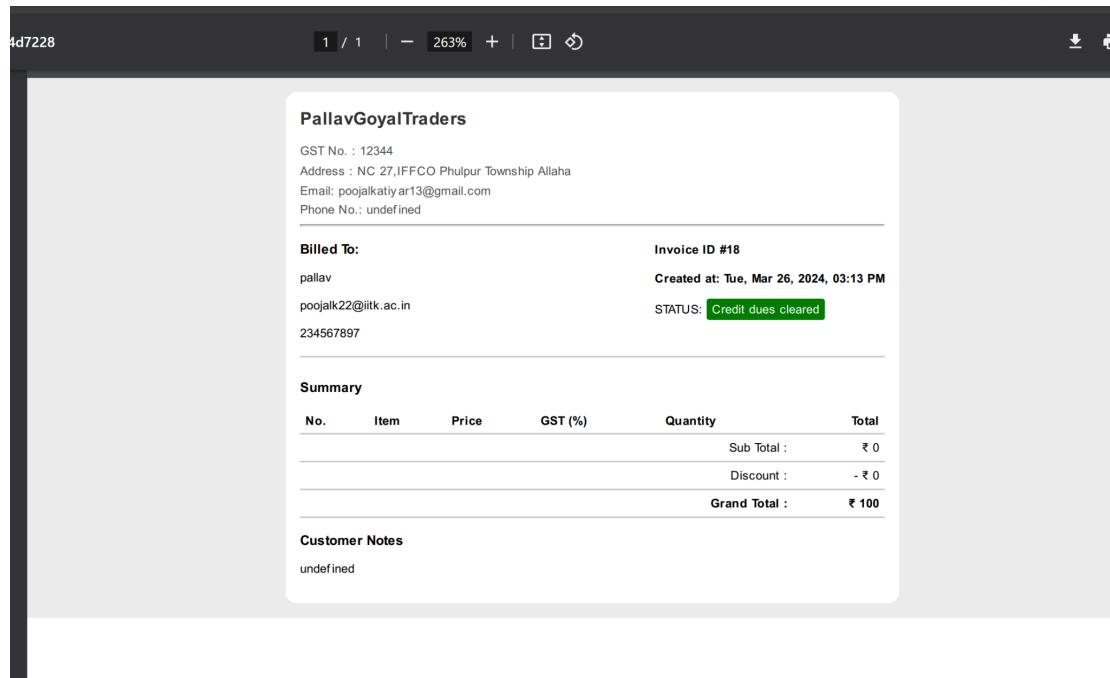
Invoice Added in Transactions History

Transaction History

 Search

DATE	CUSTOMER NAME	TYPE	AMOUNT	INVOICE ID
26/03/2024, 08:43 pm	pallav	Credit dues cleared	100	18
26/03/2024, 08:43 pm	pallav	Credit dues cleared	100	17
26/03/2024, 08:43 pm	pallav	Amount added to credit	1000	16
27/03/2024, 03:10 am	pooja	Credit	234.84	15
26/03/2024, 08:39 pm	pallav	Amount added to credit	1000	14

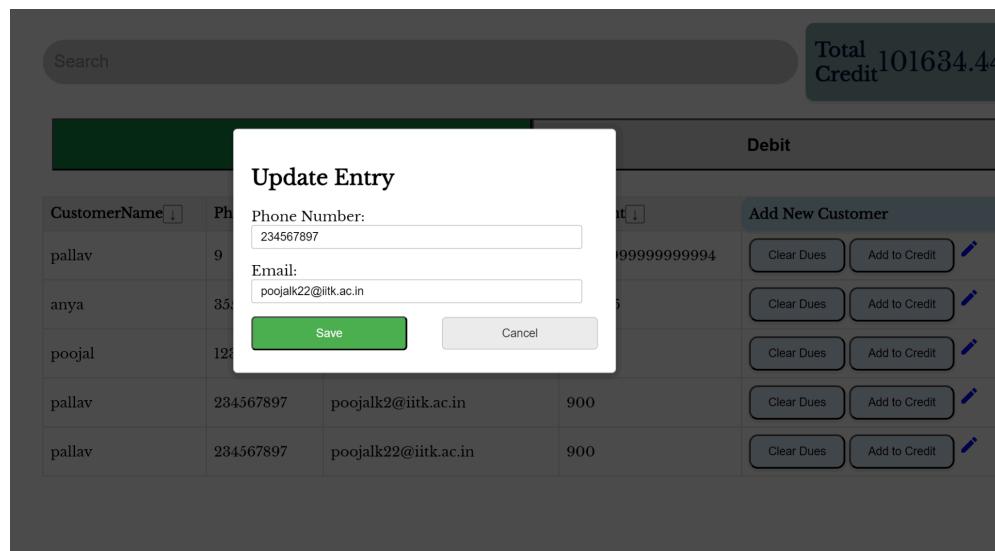
Invoice PDF



Result: Dues cleared by the customer are updated in credit and the customer is informed about the amount paid and transaction history is updated.

Test #4

Details :Edit Customer's Details



The screenshot shows a web application interface. At the top, there is a blue header bar with the text "localhost:3000 says" and "Successfully updated customer!" followed by an "OK" button. Below the header, the main content area has a title "Pending Tra" (partially visible) and a search bar labeled "Search". To the right, a blue box displays "Total Credit 101634.44". The central part of the screen is a table with two columns: "Credit" and "Debit". The table contains five rows of customer data, each with "Add New Customer" buttons and "Clear Dues" and "Add to Credit" sub-buttons.

Credit		Debit	
CustomerName ↴	Phone No ↴	Email ↴	Amount ↴
pallav	9	p	11.099999999999994
anya	35576889	anya@gmail.com	99588.5
poojal	1234567891	poojalkatiyar13@gmail.com	234.84
pallav	234567897	poojalk2@iitk.ac.in	900
pallav	234567897	poojalk22@iitk.ac.in	900

Result: pop up Box showing “Successfully updated customer!”

4. Invoice

Module Details: This model ensures seamless functionality of the invoicing system across various modules including invoice creation, automatic email notifications after invoice creation, transaction history updates, dashboard updates, preview bill and generated bill. After bill generation, the system automatically updates inventory levels batch-wise, alongside transaction history and customer databases. It enforces restrictions to ensure accuracy and efficiency, such as preventing users from entering quantities exceeding available inventory and allowing only one item per row in invoices. Additionally, it includes validating the redirection to respective pages upon completion of these actions.

Test Owner: Pallav Goyal

Test Date: 26/03/2024

Test Results: In this test we validated the successful integration of backend and frontend components of dashboard, pending transactions, transaction history mailing and viewing pdf feature. We also validated that database of invoice and customer is updated on generate bill. Here we are integrating inventory api, customer api, pdf generation api, mailing api and invoice api using frontend.

Test #1

Details : Quantity entered in the invoice greater than available in the inventory

Invoice

billing-360-dev-1.onrender.com says
Quantity entered exceeds available stock !

OK

Pallav	InvoiceID : 0
pallavgoyal136@gmail.com	9166161447

Item Details	Quantity	Price (per unit)	GST (%)	Amount (₹)	Action
ParleG 100gm	45	20	5	945	
Coco Cola 1.25L	60	50	5	3150	

Add New Row

Discount (%):
3

Customer Notes:
Thanks for your visit. Come Again!

Total Amount: ₹ 3972.15

Result: Pop up box that displays “Quantity entered exceeds available stock!”

Test #2

Details :Creating an Invoice and generating the bill and sending it via email of the customer.

Firstly fill up all the details required in the invoice and setting as paid.

Invoice

Pallav	InvoiceID : 0
pallavgoyal136@gmail.com	9166161447

Item Details	Quantity	Price (per unit)	GST (%)	Amount (₹)	Action
ParleG 100gm	45	20	5	945	
Coco Cola 1.25L	10	50	5	525	

Add New Row

Discount (%):
3

Customer Notes:
Thanks for your visit. Come Again!

Total Amount: ₹ 1425.90

Add as Credit **Preview Bill** **Generate Bill**

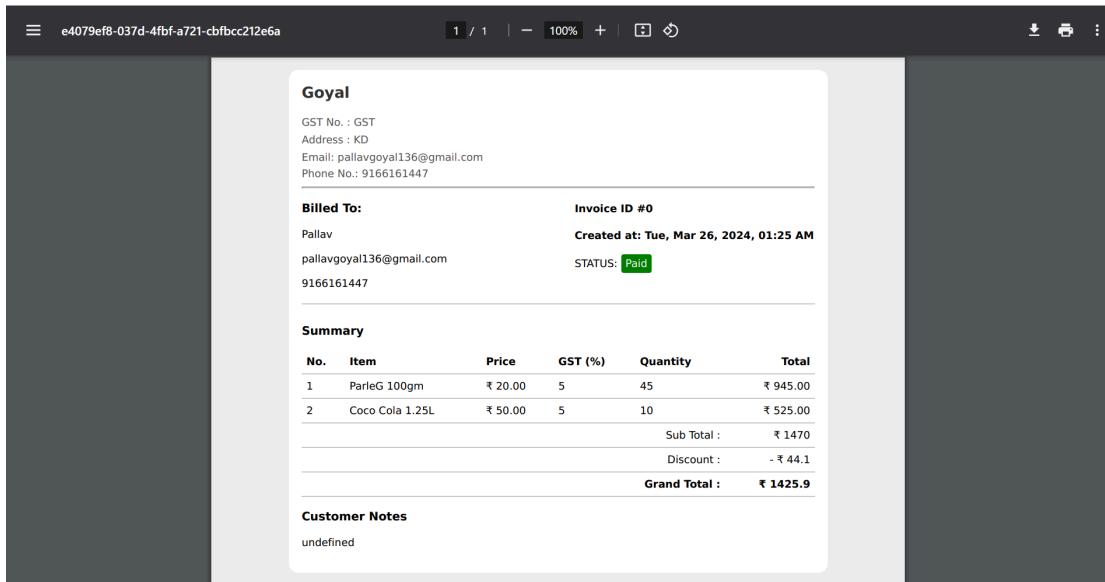
Invoice added to database successfully on generating bill

```
_id: ObjectId('6601d71dbff0240b92f7c0b4')
userID: "65f45c105fcad1b212b4bbe3"
invoiceID: 0
customerName: "Pallav"
phoneNo: "9166161447"
customerEmail: "pallavgoyal136@gmail.com"
totalAmount: 1425.9
notes: "Thanks for your visit. Come Again!"
paymentMode: "Paid"
discount: 3
▼ itemList: Array (2)
  ▶ 0: Object
  ▶ 1: Object
createdAt: 2024-03-26T01:27:20.637+00:00
totalCostPrice: 1075
totalSales: 1400
```

New customer of shopkeeper added to the customer database

```
_id: ObjectId('6601d71ebff0240b92f7c0bc')
userID: "65f45c105fcad1b212b4bbe3"
name: "Pallav"
phoneNo: "9166161447"
email: "pallavgoyal136@gmail.com"
creditAmount: 0
▼ invoiceList: Array (1)
  0: ObjectId('6601d71dbff0240b92f7c0b4')
__v: 0
```

Result:PDF gets shown on clicking Preview Bill as generate pdf api gets successfully completed



Result: Invoice mailed on the customer's email.



Billing 360

to me ▾

• • •

One attachment • Scanned by Gmail ⓘ



Test #3

Details : Reduction in the items in inventory on creating invoice.

Steps are shown below:

1.State of inventory before generating bill

Inventory							
							Search
ITEM ID ↴	ITEM NAME ↴	SALE PRICE ↴	COST PRICE ↴	STOCK ↴	MORE ACTIONS		
1	ParleG 100gm	20	15	60			
2	Coco Cola 1.25L	50	40	60			

2. Invoice creation

Invoice											
Pallav			InvoiceID : 0								
pallavgoyal136@gmail.com			9166161447								
Item Details		Quantity		Price (per unit)	GST (%)	Amount (₹)	Action				
ParleG 100gm		45		20	5	945					
Coco Cola 1.25L		10		50	5	525					
				Discount (%):		3					
<p>Customer Notes:</p> <p>Thanks for your visit. Come Again!</p>											
Total Amount: ₹ 1425.90											

3. State of inventory after generating bill showing reduced items

Inventory							
							Search
ITEM ID ↴	ITEM NAME ↴	SALE PRICE ↴	COST PRICE ↴	STOCK ↴	MORE ACTIONS		
2	Coco Cola 1.25L	50	40	50			
1	ParleG 100gm	20	15	15			

Result: On creating invoice, items are reduced in inventory.

Test #4

Details: Items of earlier batches are reduced first from the inventory upon creating invoice.

State of batches of ParleG before generating bill

Inventory				
Add New Item				
<input type="text"/> Search				
ITEM ID	ITEM	BATCH ID	BATCH QUANTITY	BATCH EXPIRY
1	ParleG	1	20	28/03/2024
2	Coco C	2	20	03/04/2024
		3	20	09/04/2024
EditBatch Delete				
EditBatch Delete				
EditBatch Delete				
Cancel				

State of batches of ParleG after generating bill showing items of earlier batch finished earlier

The screenshot shows the 'Inventory' application interface. A modal dialog box is open in the center, displaying a table with a single row of data. The table has columns: ITEM ID, ITEM, BATCH ID, BATCH QUANTITY, BATCH EXPIRY, MORE ACTIONS, and DELETE. The data in the table is:

ITEM ID	ITEM	BATCH ID	BATCH QUANTITY	BATCH EXPIRY	MORE ACTIONS	DELETE
2	Coco C	8	15	09/04/2024	EditBatch	

Below the table, there is a 'Cancel' button. In the background, the main inventory list shows two items: 'Coco C' and 'ParleG'. To the right of the modal, there are two sections labeled 'MORE ACTIONS' each containing icons for edit, add, and delete.

Test #5

Details Changes in Transaction history before and after generation of invoice and feature to view the invoice from transaction history.

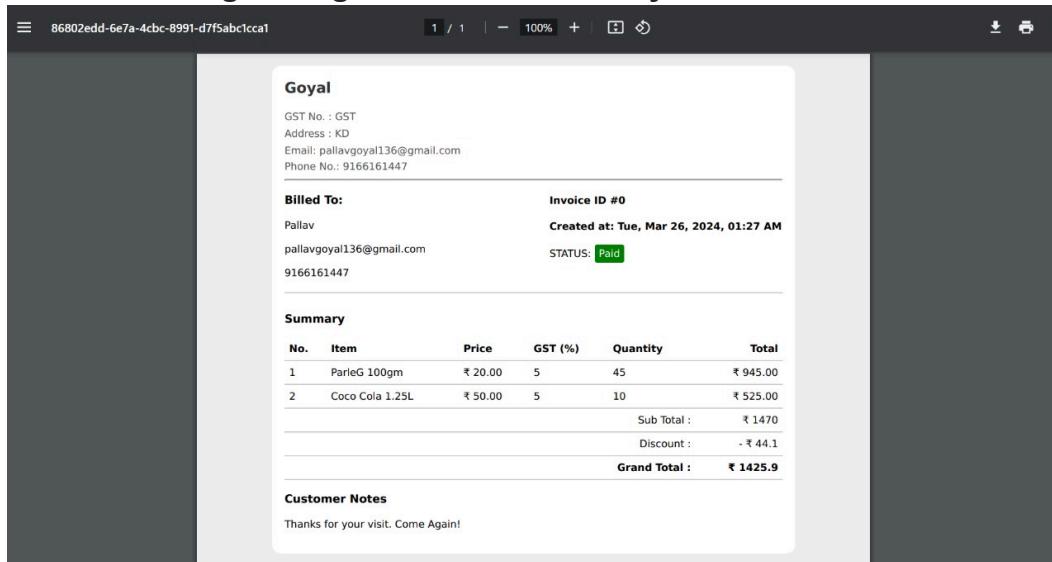
State of transaction history before generating bill

The screenshot shows the 'Transaction History' page. At the top, there is a search bar with a magnifying glass icon and the word 'Search'. Below the search bar is a table with columns: DATE, CUSTOMER NAME, TYPE, AMOUNT, and INVOICE ID. The table currently contains no data.

State of transaction history after generating bill

Transaction History				
 Search				
DATE	CUSTOMER NAME	TYPE	AMOUNT	INVOICE ID
26/03/2024, 06:57 am	Pallav	Paid	1425.9	<u>0</u>

Invoice viewing through transaction history



Goyal

GST No.: GST
Address : KD
Email: pallavgoyal136@gmail.com
Phone No.: 9166161447

Billed To: Pallav **Invoice ID #0**
pallavgoyal136@gmail.com **Created at:** Tue, Mar 26, 2024, 01:27 AM
STATUS: Paid 9166161447

Summary

No.	Item	Price	GST (%)	Quantity	Total
1	ParleG 100gm	₹ 20.00	5	45	₹ 945.00
2	Coco Cola 1.25L	₹ 50.00	5	10	₹ 525.00
					Sub Total : ₹ 1470
					Discount : - ₹ 44.1
					Grand Total : ₹ 1425.9

Customer Notes
Thanks for your visit. Come Again!

Test #6

Details Changes in Dashboard before and after generation of invoice

Dashboard before generating bill

Dashboard



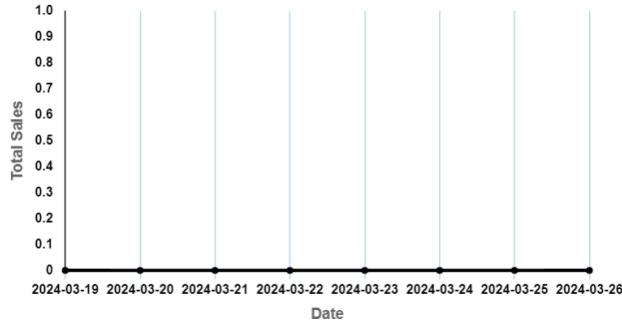
Today's Sales
₹ 0

Today's Profit
₹ 0

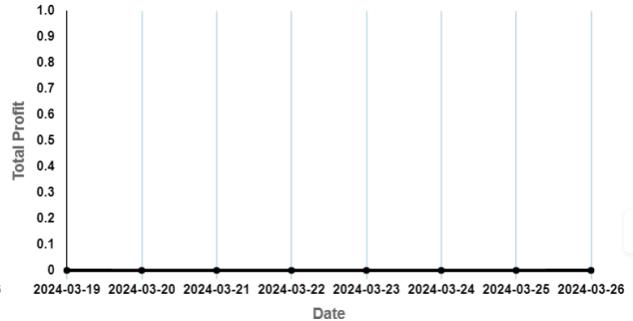
Today's Bills
0

Yesterday's Sales
₹ 0

Total Sales this week



Total Profit this week



Dashboard updated after generate bill

Dashboard



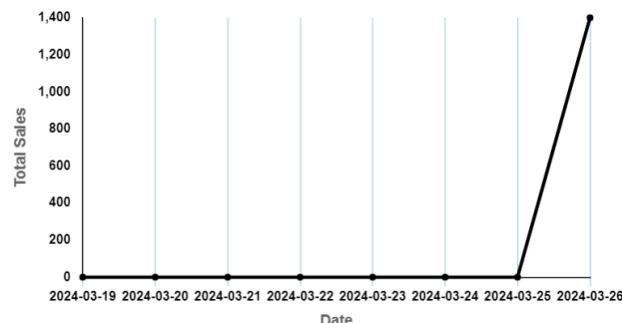
Today's Sales
₹ 1400

Today's Profit
₹ 325

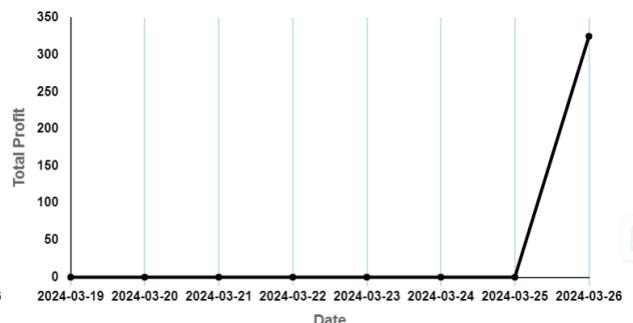
Today's Bills
1

Yesterday's Sales
₹ 0

Total Sales this week



Total Profit this week



Test #7

Details Items bought through credit. Updated in the pending transactions. Corresponding invoice is also generated and mailed to the customer.

Addition of items and setting it as credit

Invoice



Pallav	InvoiceID : 1
pallavgoyal136@gmail.com	9166161447

Item Details	Quantity	Price (per unit)	GST (%)	Amount (₹)	Action
ParleG 100gm	2	20	5	42	

Add New Row

Discount (%):

5

Customer Notes:

Thanks for your visit. Come Again!

Total Amount: ₹ 39.9

Set as Paid

Preview Bill

Generate Bill

Invoice pdf in case of credit

The screenshot shows a PDF invoice for a customer named Goyal. The header includes the customer's GST No., Address, Email, and Phone Number. The bill is for ParleG 100gm at ₹ 20.00 per unit, quantity 2, with a total of ₹ 42.00. A discount of ₹ 2.1 is applied, resulting in a Grand Total of ₹ 39.9. The invoice is marked as 'Credit'.

No.	Item	Price	GST (%)	Quantity	Total
1	ParleG 100gm	₹ 20.00	5	2	₹ 42.00
					Sub Total : ₹ 42
					Discount : - ₹ 2.1
					Grand Total : ₹ 39.9

Customer Notes
undefined

Invoice of existing customer gets added to existing customer database instead of creating a new customer and subsequently adds credit amount to customer

```

_id: ObjectId('6601d71ebff0240b92f7c0bc')
userID: "65f45c105fcad1b212b4bbe3"
name: "Pallav"
phoneNo: "9166161447"
email: "pallavgoyal136@gmail.com"
creditAmount: 39.9
▼ invoiceList: Array (2)
  0: ObjectId('6601d71dbff0240b92f7c0b4')
  1: ObjectId('6601dbdcfff0240b92f7c132')
  --v: 1

```

State of Pending transaction before generating a credit bill

Pending Transactions ⟳

Search	Total Credit 0			
Credit Debit				
Customer Name	Phone No.	Email	Amount	Add New Customer

Pending Transaction after adding bill on credit

Pending Transactions ⟳

Search	Total Credit 39.9			
Credit Debit				
Customer Name	Phone No.	Email	Amount	Add New Customer
Pallav	9166161447	pallavgoyal136@gmail.com	39.9	Clear Dues Add to Credit ↗

Transaction History after generating credit bill

Transaction History



Search

DATE	CUSTOMER NAME	TYPE	AMOUNT	INVOICE ID
26/03/2024, 07:17 am	Pallav	Credit	89.9	<u>1</u>
26/03/2024, 06:57 am	Pallav	Paid	1425.9	<u>0</u>

4. Reports

Module Details: This model ensures smooth functionality of the report generation system as soon as the user chooses the desired range of dates

Test Owner: Pallav Goyal

Test Date: 27/03/2024

Test Results: In this test we validated the successful integration of backend and frontend components of reports which plots graphs on the basis of data received from backend.

Test #1

Details : The dates were added and consequently the reports were shown

Reports



Start Date: dd-mm-yyyy



End Date: dd-mm-yyyy



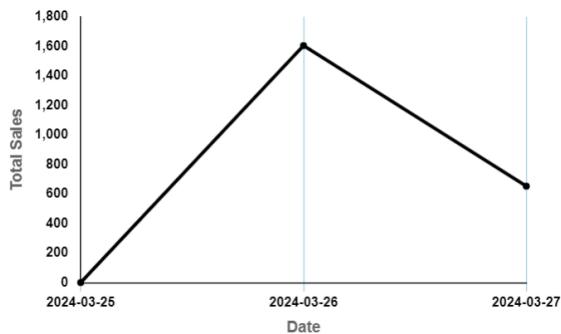
Reports



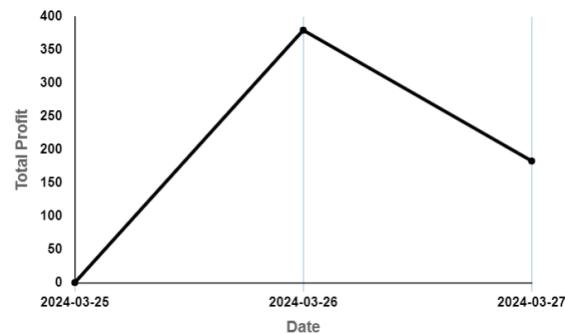
Start Date: 25 - 03 - 2024

End Date: 27 - 03 - 2024

Total Sales/Date



Total Profit/Date



4. System Testing

FUNCTIONAL REQUIREMENTS

1. Requirement: The user should be able to sign in through his email ID (or phone number) and password if he is already a member.

This sign-in functionality underwent thorough testing to ensure its reliability and effectiveness. We created test cases covering various scenarios, including valid and invalid inputs. These test cases were executed by manually navigating to the sign-in page, inputting different combinations of email IDs and passwords, and observing the system's responses. For instance, we tested the successful sign-in process by entering valid credentials and verifying that the user was redirected to the Dashboard page. Additionally, we intentionally input invalid email formats, non-registered user details, and incorrect passwords to validate, then appropriate error messages ("wrong credentials") were displayed in each scenario. Throughout the testing process, no bugs or issues were encountered, indicating that the sign-in functionality operates as intended and meets the specified requirements.

Test Owner: Kundan Kumar

Test Date: 26/03/2024

Test Results: The Sign-in page worked as expected. We had tested it on our deployed website. No bug was reported.

Additional Comments: NA

2. Requirement: A new user should be able to sign up by creating his account through filling required details(which include his name, firm's name, phone number, email ID, registered GST number) and setting a valid password.

The sign-up functionality enables new users to create accounts by providing required details, including their name, firm's name, phone number, email ID, and registered GST number, along with setting a valid password. To ensure the effectiveness of this functionality, we devised a series of test cases covering various scenarios. These tests were executed by manually navigating to the sign-up page, inputting valid and invalid data into the respective fields, and observing the system's responses. We verified that users could successfully sign up by providing all required details and setting a valid password, leading to the creation of their account. Additionally, we tested scenarios such as entering incomplete or incorrect information, duplicate email IDs, and invalid passwords(less than required min. length) to ensure proper validation and error handling. One bug was encountered, where the user was able to enter any length of phone number. Throughout the testing process, no other major issues or bugs were encountered, confirming that the sign-up functionality functions as intended and meets the specified requirements.

Test Owner: Kundan Kumar

Test Date: 26/03/2024

Test Results: The Register page worked as expected. One small bug was encountered where any length of phone number was acceptable. We fixed it and made it accept only phone numbers of length 10.

Additional Comments: NA

3. Requirement: There should be an option of 'Forgot Password?' in case the user forgets the password. Authentication shall be carried out through OTP verification on the email the user had provided earlier.

The "Forgot Password" functionality provides users with an option to reset their password in case they forget it. Authentication for password reset is carried out through OTP (One-Time Password) verification sent to the email address the user had provided earlier during registration. To ensure the effectiveness of this functionality, a series of test cases covering various scenarios were devised and executed. These tests involved manually navigating to the "Forgot Password" page, inputting the registered email ID, and initiating the password reset process. Upon entering a valid email ID, an OTP should be generated and sent to the user's email address for verification. Subsequently, the user should be prompted to enter the OTP received via email. The system should then validate the OTP entered by the user and allow them to reset their password if the OTP is correct and then we tried to login with a new password , everything worked as expected. Additionally, tests were conducted to verify error handling in scenarios such as entering an invalid or non-registered email ID or wrong OTP , each time it worked as expected. Throughout the testing process, no issues or bugs were encountered, confirming that the "Forgot Password" functionality operates as intended and provides users with a secure and reliable password recovery option.

Test Owner: Kundan Kumar

Test Date: 26/03/2024

Test Results: The Forgot Password page worked as expected. We had tested it on our deployed website. No bug was reported.

Additional Comments: NA

4. Requirement: The dashboard shall display the firm name and the GST number.

When a user is logged in , the Dashboard displays Users Firm Name and GST number. The test cases include registering new users and checking if it is correctly displayed on Dashboard. Everything works as expected no bugs were found.

Test Owner: Kundan Kumar

Test Date: 26/03/2024

Test Results: No bugs were found. Everything works as expected.

Additional Comments: NA

5. Requirement: The dashboard shall provide the user with various options like invoices, inventory, pending transactions, transaction history, FAQs, and contact us.

To check this requirement , after logging in we manually navigated to each of the options making sure each of the options is easily accessible. Everything worked fine , no bugs were detected.

Test Owner: Kundan Kumar

Test Date: 26/03/24

Test Results: The Dashboard provides options to navigate to different pages like invoices, inventory, pending transactions etc. everything works fine and no bugs were detected.

Additional Comments: NA

6. Requirement: The dashboard shall provide the user with the details of his daily sales, daily profit, number bills generated in a day (customer count), and the previous day's sales.

For testing the functional requirement of the dashboard providing details such as daily sales, daily profit, bills count, and previous day's sales, a comprehensive manual testing was done. This included verifying that the dashboard accurately displayed these metrics by comparing them with the expected values derived from test data. Tests were conducted to ensure that daily sales and profit calculations were correct, customer count was accurately recorded, and previous day's sales were retrieved and displayed correctly. By executing these tests, the functionality was thoroughly evaluated, and no discrepancies or bugs were identified, ensuring the reliability and accuracy of the dashboard's reporting capabilities.

Test Owner: Kundan Kumar

Test Date: 26/03/24

Test Results: The Dashboard page correctly displays all the metrics and correctly fetches the previous day records. Everything works as expected no major bugs were found.

Additional Comments: NA

7. Requirement: The dashboard should show the graphical plot of total profits earned per day over a week and total sales per day over a week.

To ensure the functionality of the dashboard in displaying graphical plots of profits earned per day over a week and total sales per day over a week, a lot of different tests were manually performed. The testing process began with data verification to ensure the accuracy of the dataset used for plotting. Subsequently, the dashboard's ability to render graphical plots accurately and intuitively was seen, ensuring that the plots provided a clear representation of the profit and sales trends over the specified week. Data consistency tests were conducted to verify that each data point on the graphical plots correspond correctly to the underlying profit earned or total sales value for each day. We also checked hover-over functionality for detailed information. Through all testing, no issues or inconsistencies were identified, confirming the reliability and accuracy of the dashboard's graphical plotting feature.

Test Owner: Kundan Kumar

Test Date: 26/03/2024

Test Results: The graphical plotting feature on the dashboard accurately presents profits earned and total sales per day over a week, with intuitive and visually appealing plots. No major bugs were found.

Additional Comments: NA

8. Requirement: The dashboard shall also have the Profile option (where the user can change or update his other details except email) and the log-out option.

The Profile and Log-out options on the dashboard underwent different test to validate their functionality. Manual testing confirmed that the Profile option enables users to efficiently update their details, excluding email, with changes accurately reflected in the system. Additionally, the Log-out option securely logs users out of their accounts, terminating the current session and redirects them to the login page for re-authentication. No bugs were found.

Test Owner: Kundan Kumar

Test Date: 26/03/24

Test Results: The profile and log-out option works as expected. No bugs were found.

Additional Comments: NA

9. Requirement: The system shall provide a unique invoice ID for each invoice. This would be the total number of invoices he has created till now (indexed from 0).

This test includes the backend function to get the count of invoices the user has created till that time. Since invoice ID must be unique and auto-generated by the system, the invoice ID is set to the count of invoices of that user. We acted as a general user, on clicking the invoice page, the invoice ID was displayed automatically and correctly. This got updated only on generating a new invoice, which is exactly how it should work.

Test Owner: Pragati Agrawal

Test Date: 27/03/2024

Test Results: The invoice ID gets updated automatically after creating each invoice. We tested it on our deployed website and no bug was reported.

Additional Comments: NA

10. Requirement: The system shall automatically add a new customer to the list of customers, in case a new customer comes for the invoice (i.e. if a new customer email id). If any existing customer comes again, that invoice will be added to the same customer's invoices.

This test includes both the frontend and backend to find or add a customer to the existing list of any user. We acted as a general user and tried both these. First we added a new invoice for a new customer email. This added a new customer in the database. Then we created another invoice for the same customer. This added the invoice to the list of invoices of that customer and changes in amount were reflected in the pending transactions page, if that invoice was given as credit.

Test Owner: Pragati Agrawal

Test Date: 27/03/2024

Test Results: For every new customer (new email), a new customer was added, and for a pre existing customer, the invoice got added to the pre existing list of invoices. This was exactly how it should work. We tested it on our deployed website and no bug was reported.

Additional Comments: Future improvement: To fetch the details of any customer using the customer email, if customer already exists.

11. Requirement: The system shall allow the user to customize an invoice with details like the name of the customer and customer notes. He shall also be able to add items and specify quantity (using a search with the name of the item), and apply discounts(if any).

This test includes testing frontend input boxes, so that they work correctly and take in valid and correct inputs. We acted as a general user and tried to customize a new invoice. We could fill in all the customer details (name, email and phone number) and then select items from the list of available items in the inventory. On entering the quantity of the selected item, the amount for that item and the total amount of the invoice got updated automatically and correctly. The discount entered also correctly updated the total amount of the invoice.

Test Owner: Pragati Agrawal

Test Date: 26/03/2024

Test Results: The invoice page worked as expected. We tested it on our deployed website and almost no bug was reported.

Additional Comments: NA

12. Requirement: The system shall automatically fill the sale price and applicable GST(%) for any item after selecting it from the list of items in the inventory.

This test includes fetching the details of that item from the inventory and filling in the table in the invoice. Once an item is added to an invoice, it should not be added again to the same invoice. Similarly, if an item is deleted from the invoice, it should again be available to be added to the invoice. We acted as a general user, and test these. Everything worked seamlessly.

Test Owner: Pragati Agrawal

Test Date: 27/03/2024

Test Results: The details were filled in correctly. We tested it on our deployed website and no bug was reported.

Additional Comments: NA

13. Requirement: If the selected quantity of an item is greater than the quantity available in inventory(including all batches), the system shall generate an error message saying that the required quantity is greater than that available in inventory.

This test includes both the frontend and backend, to check if the quantity of any item entered in the invoice is feasible. We tried to add quantity of an item more than its available quantity, and the website displayed an alert message, saying that “Quantity exceeds the available stock”.

This was tested in integration testing “Invoice, Test#1”. This quantity includes the total non-expired quantity of each batch in the inventory.

Test Owner: Pragati Agrawal

Test Date: 26/03/2024

Test Results: The website shows an error if the quantity exceeds the available quantity in the inventory. We tested it on our deployed website and no bug was reported.

Additional Comments: The quantity of any item in the invoice gets reduced from the batch having the earliest expiry date.

14. Requirement: The software shall automatically calculate the total amount based on the quantity of each item and after applying tax and discount (if any).

This test includes the frontend component of the total amount in the invoice. This value needs to be updated correctly on changing the quantity of any pre-existing item in the invoice, addition/deletion of any item from the invoice, changing any item in a pre-existing row or changing the value of the overall discount. We acted as a general user and tried all these modifications in the invoice, and in each case, the total amount got updated correctly.

Test Owner: Pragati Agrawal

Test Date: 26/03/2024

Test Results: We tested the total amount component in many ways on the deployed website and it worked perfectly fine in all cases.

Additional Comments: Initially some bugs were there in the total amount calculation. We fixed those bugs through recursive programming, rounded off each value to 2 decimal places, and asked another team of 2-3 members to check it. All bugs found have been resolved.

15. Requirement: The system should provide an option to add as credit in case the customer wants to pay later. This option shall automatically update the credit log in the pending transactions page of the user.

This test includes the frontend and backend functions. On adding an invoice as credit, the system should mark it as "credit" and should add this amount to the prevailing total dues of that customer. This invoice should also be marked as "credit" on the transaction history page. We acted as a general user and tried to add an invoice as credit for a pre-existing customer, and it worked perfectly. If it is the first credit invoice of any customer, a new entry will be created in the pending transactions page, otherwise the amount will simply be added to the total pending amount of that customer.

Test Owner: Pragati Agrawal

Test Date: 26/03/2024

Test Results: We tested the “Add as credit” feature of invoice on our deployed website, and it worked perfectly fine. No bug was reported.

Additional Comments: NA

16. Requirement: The software shall allow the user to preview and generate the bill. With the generate bill button, the system shall add a new invoice to the database, send the invoice via email to the customer, make a new entry in the transaction history page, make required changes in the inventory and add to pending transactions, if necessary.

This test includes both frontend and backend functions to work. We acted as a general user and tested the preview bill button. The system showed us a preview of the invoice we had created (All invoice fields must be filled). Similarly, the generate bill button added a new invoice to the database of that user, sent a mail to the customer (on the email ID given in the invoice), added this invoice to the Transactions History page and reduced the number of items in the inventory. If it was a credit invoice, this was also updated on the Pending Transactions page.

All these tests are also shown in Integration Testing.

Test Owner: Pragati Agrawal

Test Date: 26/03/2024

Test Results: We tested the preview bill and generated bill functionalities on our deployed website and no bug was reported. All required changes were made seamlessly and smoothly.

Additional Comments: The pdf generation feature had some bugs initially, and pdf was not being displayed on the deployed website. Then we tried a variation of our original method and it worked. We had also improved the look of the invoice from the initial version.

17. Requirement: The Inventory page should include a list of items, a search bar, a filter button, and an "Add New Item" option. For a particular item the following columns should be shown: Item Name/ID, Sale Price, Purchase Price, Stock.

The test checked for all the mentioned components in the deployed website. We acted as a general user and tried to access the inventory page. All the items of the user are fetched from the database and shown as a list. All the details - Item ID, Item Name, Sale Price, Cost Price, Stock are correctly shown in the table under appropriate columns. An "Add New Item" button was present which can be used to add items in the inventory. Filter buttons were present alongside each column heading to sort the items according to that column and a Search bar was also present at the top.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: The invoice page contains all the components required in the SRS. All the data shown in the inventory table is correctly fetched from the database.

Additional Comments: NA

18. Requirement: The system should allow the user to click on the search bar and search items by name/ID. Also, it should allow the user to click the filter option and apply filter(s) on the results of the search bar

Various inputs in the search bar were entered, various filters were applied, and test cases consisting of a combination of these were also tested on the deployed website.

Upon searching in the search bar, only the items with Item Name containing the input string were shown in the list. When filters based on Item ID, Item Name, Sale Price, Cost Price, Stock were applied, the items could be arranged in ascending or descending order of the filter selected. If filter was applied after an input string was entered in the seach bar, the filter worked correctly on the search results.

Also the items were colour-coded and sorted based on their expiry date as a default setting.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: Search bar and filters worked fine. Filters worked even on the search results of the search bar. Items were sorted based on expiry date by default. Other searches could be applied. Almost no bugs were reported.

Additional Comments: NA

19. Requirement: The system should allow the user to click on the “Add New Item” option to add new items to the inventory. Adding a new item should require filling in the following fields: Item Name/ ID, Quantity, Sales Price per unit, GST, Category, Cost Price per unit, and Batch Expiry.

We acted as a general user and tried to add new items to the inventory on the deployed website. On clicking the “Add New Item” button, a dialog box opens where all the details can be filled. If all the required fields are not added, appropriate error messages are displayed. On filling all the details - Item ID, Item Name, Sale Price, Cost Price, GST and category, and clicking on “Save”, a new item with zero stock is added in the list. Batches for an item were added using the “Add Batch” button in the list. On clicking it, a dialog box

appeared. After entering the batch ID, quantity and batch expiry and clicking on “Save”, the item was automatically colour-coded based on the latest batch expiry. Also the total stock of the item correctly displayed the sum of quantity in all the batches.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: Adding item in inventory feature using “Add New Item” button and adding batches work as expected. Almost no bugs were reported.

Additional Comments: NA

20. Requirement: The system should allow the user to view the item profile, which should include all the above item details, batches, and their expiry. Options to edit or delete the item should also be available.

There was a column in the table of items, containing four buttons - “Edit Item”, “Add Batch”, “View Batch”, “Delete Item”. All these buttons were tried. Upon clicking “Edit Item”, a dialog box similar to “Add New Item” was opened in which changing the details was possible. All the changes were reflected after clicking on “Save”.

Upon clicking “View Batch”, a dialog box appeared which displayed all the batches of the item (and their details). Each batch had an “Edit Batch” option which opened a dialog box similar to “Add Batch”. On entering all the details and clicking on “Save”, batch was updated. Each batch also had a “Delete Batch” option which could be used to remove a particular batch.

Upon clicking “Delete Item”, the item was removed from the database as well as the list of items.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: Options for viewing, editing and deleting items and their batches are available as required by the SRS. All features work as expected. Appropriate error messages are displayed if required fields are not entered. All the changes are also correctly reflected in the database.

Additional Comments: “Add Batch” button was tested along with “Add New Item” button, hence it is not mentioned again here.

21. Requirement: The Pending transactions page shall show the list of customers with pending credit along with search and filter options. For a particular customer, the list shall show the name/ID, phone number, email and total credit.

The test checked for all the mentioned components in the deployed website. We acted as a general user and tried to access the Credit tab on the Pending Transactions page. All the customers of the user with pending credit are fetched from the database and shown as a list. All the details - Customer's name, email, phone number and total credit are correctly shown in the table under appropriate columns. Filter buttons were present alongside each column heading to sort the items according to that column and a Search bar was also present at the top.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: The Pending Transactions page contained all the components as expected. All the data was correctly fetched and displayed from the database.

Additional Comments: Since each user is identified by a unique email, an explicit customer ID was redundant and hence removed.

22. Requirement: The system shall allow the user to search for a particular customer by Name/ID/ Phone Number,/email. He can use the filter option to narrow down the results of the search option.

Various inputs in the search bar were entered, various filters were applied, and test cases consisting of a combination of these were also tested on the deployed website.

Upon searching in the search bar, only the customers with Customer Name containing the input string were shown in the list. When filters based on email, phone number and credit amount were applied, the customers could be arranged in ascending or descending order of the filter selected. If filter was applied after an input string was entered in the search bar, the filter worked correctly on the search results.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: Search bar and filters worked fine. Filters worked even on the search results of the search bar. Almost no bugs were reported.

Additional Comments: NA

23. Requirement: The user shall be able to use the "Add New Customer" option to add a new customer's record manually. While adding a new customer, the following details are to be filled: Name, Phone Number, email and amount. A notification containing these details shall be sent to the customer for authentication.

There is an “Add New Customer” button, which can be used to manually add a new customer. On clicking it a dialog box opens, in which all the fields can be entered. On clicking “Save”, a new entry in the table (and in the database) is created. An invoice showing the credit amount is created and added to the database (this can also be viewed on the Transaction History page along with other invoices). An email with a pdf of this invoice as attachment is automatically sent to the Customer’s email.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: “Add New Customer” button works as expected and fulfills the requirements mentioned in the SRS. Appropriate error messages are displayed if required fields are not entered or if the email entered is invalid.

Additional Comments: NA

24. Requirement: The user shall be able to edit the credit log and details of the customer.

There are options - “Clear Dues”, “Add to Credit” and “Edit Customer”, which allow the user to clear credit, add credit and edit customer details (email and phone number) respectively. On clicking “Clear Dues” or “Add to Credit” button, a dialog box opens, where user can enter the amount and click on “Submit” to reflect the changes in the database. Appropriate error message is shown if amount to be cleared is more than pending credit amount. On clicking the “Edit Customer” option, a dialog box appears allowing the user to change email and phone number of the customer. Changes are reflected are clicking on Submit.

Any user with zero credit is automatically removed from the credit list. Also any change made in the credit amount (“Clear Dues” or “Add to Credit”) is recorded as an invoice in the database (this can also be viewed on the Transaction History page along with other invoices). An email with a pdf of this invoice as attachment is automatically sent to the Customer’s email.

Test Owner: Dhruv Gupta

Test Date: 26/03/2024

Test Results: All the functionalities are working as expected. No bugs were reported.

Additional Comments: NA

25. Requirement: The Pending transactions page shall show the list of suppliers with pending debit along with search and filter options. For a particular supplier, the list shall

show the name/ID, phone number, email and total debit. The user shall be able to - search for a supplier using the search bar, apply filters on the search results, add a new supplier, view/edit the debit log and details of any supplier.

All these components and functionalities could be accessed on Debit tab of the Pending Transactions page. All the functionalities are similar to the Credit tab functionalities (except that no email is sent to the supplier in case of editing the debit amount). Search and filters worked as expected. The options “Add Supplier”, “Remove Amount”, “Add Amount” and “Edit Supplier” work in the same way as the options “Add New Customer”, “Clear Dues”, “Add to Credit” and “Edit Customer” on the Credit tab respectively. Every change in amount is also recorded as an invoice in the database and can be viewed on the Transaction History page.

Test Owner: Dhruv Gupta

Test Date: 27/03/2024

Test Results: All the functionalities are working as expected. No bugs were reported.

Additional Comments: All the functionalities were tested in the same way as the Credit tab functionalities. Hence detailed test results are not mentioned again.

26. Requirement: The system shall show the list of all invoices created by the user on the Transactions History page. This list will also include the invoices generated due to modifications in the amount of any customer on the Pending Transactions page. These entries in the table can also be filtered on the basis of customer name.

This test includes the backend function to get all the types of invoices generated: “Paid”, “Credit”, “Credit dues cleared” and “Amount added to credit”. The first two modes come from the two payment modes on the Invoice page. The remaining two modes come from the two features in the Pending Transactions, if some amount is deducted from the remaining credit of that customer, then “Credit dues cleared” otherwise if it is added then “Amount added to credit”. We acted as a general user and created all these types of transactions.

All the invoices were correctly added to this page. The invoice ID was also incremented correctly. A search bar is present to filter the entries in the transactions history page, on the basis of customer name.

Test Owner: Pragati Agrawal

Test Date: 27/03/2024

Test Results: We tested it on our deployed website and all kinds of invoices were shown as expected. The search bar also worked perfectly.

Additional Comments: The time displayed on the invoice generation through pending transactions page had a bug. It has been resolved.

27. Requirement: The system shall show enable the user to view the PDF of any invoice (Paid, Credit, Credit dues cleared, Amount added to credit) by clicking on the link in the invoice ID column in each invoice on the Transactions History page.

This test includes backend to fetch the invoice details to be displayed using the invoice ID, and to create a PDF of it to display on the website. We acted as a general user and tried to open all these kinds of PDFs of invoices, and everything works smoothly.

Test Owner: Pragati Agrawal

Test Date: 27/03/2024

Test Results: We tested it on our deployed website and all kinds of invoices were viewed as PDF correctly. All details were rendered correctly. Almost no bug was reported.

Additional Comments: The time displayed on the invoice generation through pending transactions page had a bug. It has been resolved.

28. Requirement: The software system shall provide users with the capability to access comprehensive reports detailing Total sales, Total profit, and Number of bills for each date within specified date ranges. Furthermore, users shall have the ability to view the distribution of bills categorized as either paid or credit.

To check the functionality outlined in the requirement, a lot of different manual tests were performed. This involved a series of tests aimed at ensuring accurate reporting of Total sales, Total profit, Number of bills, and bill distribution within specified date ranges by manually changing system date and generating invoices on different dates and data shown by reports were manually verified. No bugs were found, everything works as expected.

Test Owner: Kundan Kumar

Test Date: 27/03/2024

Test Results: The Reports section was tested on our deployed website and no bugs were found. All the details shown were coherent with the data.

Additional Comments: NA

29. Requirement: The FAQs page must display a list of Frequently Asked Questions and their answers, helping the user with common queries related to the software.

On opening the FAQs page using the Navbar, a list of questions and their answers is displayed. All the questions are valid and answered satisfactorily.

Test Owner: Dhruv Gupta

Test Date: 27/03/2024

Test Results: All the components were correctly rendered and displayed on the deployed website. No bugs were reported.

Additional Comments: NA

30. Requirement: In case the user faces any issue, he should be able to contact the developing team using this feature and if the user wants any information about the software/development team, he should be able to use this feature to reach out.

The "Contact Us" feature facilitates seamless communication between users and the development team, allowing users to address any issues, queries, or requests for information about the software or development team. By filling out a contact form that includes fields for their name, email, and message, users can submit their queries directly to the team. Thorough testing ensures that users can successfully submit queries and the development team receives queries through mail, few bugs were encountered , where users can send queries to the team without filling up their name details and email. These bugs were fixed making these fields mandatory and adding an additional check for valid email syntactically. Additionally, the contact information section prominently displays the team's phone number for easy access. Upon successful submission of a query, users receive a confirmation message, enhancing their confidence in the effectiveness of the communication channel. Overall, the "Contact Us" feature enhances user experience by providing a reliable and efficient means of reaching out to the development team for assistance or information.

Test Owner: Kundan Kumar

Test Date: 26/03/24

Test Results: The Contact Us page worked as expected.Few minor bugs were detected , where users can get away with sending queries to the development team without providing their Name and contact Email.These fields are now made mandatory.

Additional Comments: NA

NON FUNCTIONAL REQUIREMENTS

This includes requirements related to how the software performs under different load conditions, response times, maintainability, scalability etc.

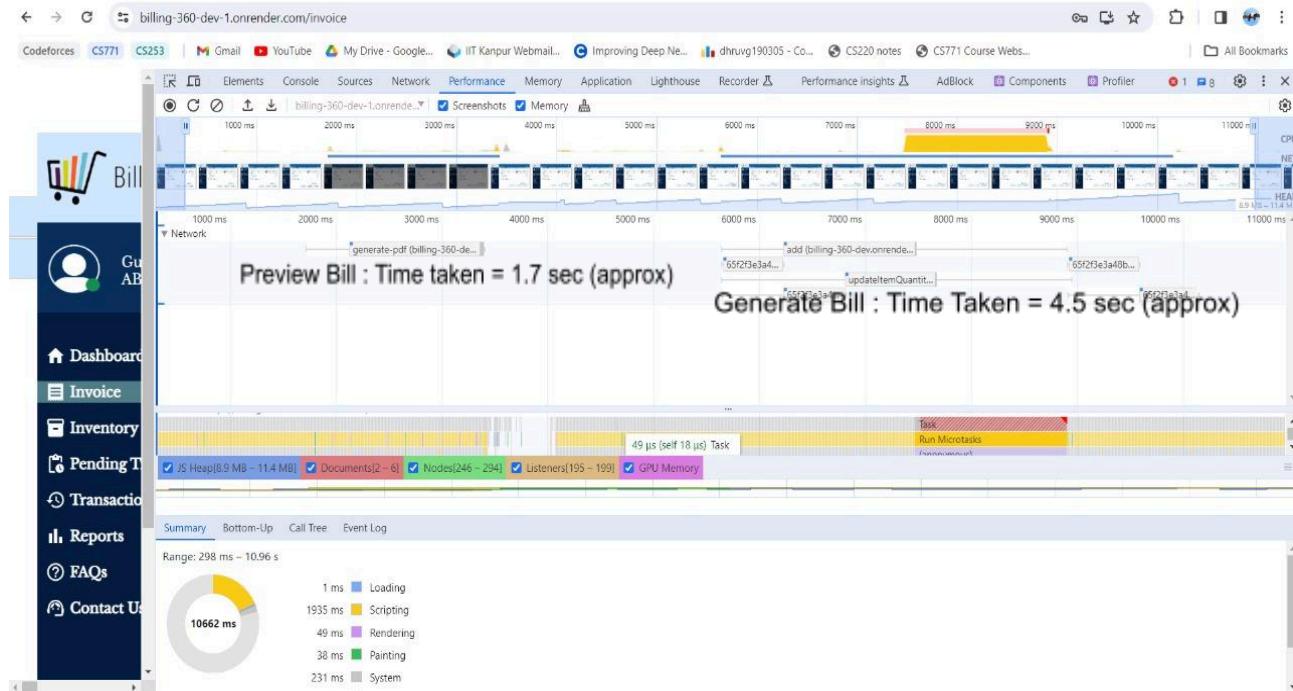
Test Owners: Pragati Agrawal, Dhruv Gupta and Kundan Kumar

Test Dates: 24/03/2024 - 28/03/2024

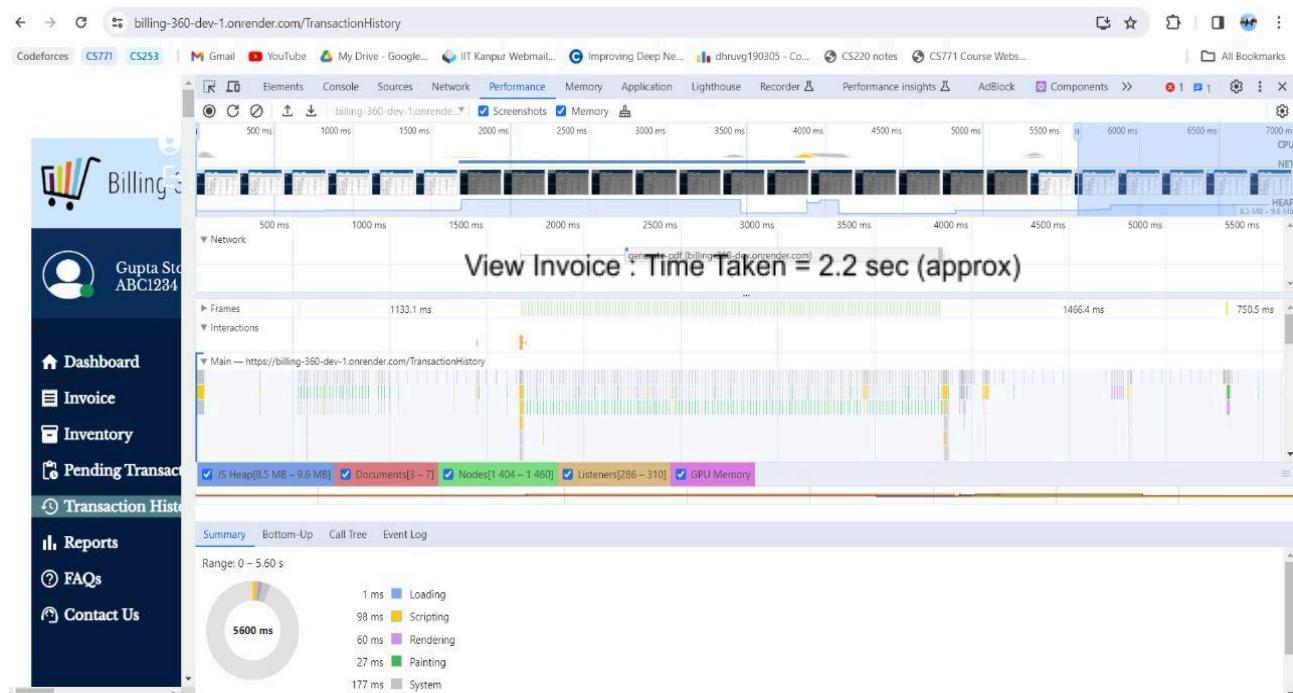
Test Results:

1. Performance Requirements:

- *The search operation used while adding items to a bill should not take more than 0.5 seconds*
The search operation on all search bars works almost instantaneously without any time delay.
- *The software should allow no less than 10000 entries in the inventory and no less than 10000 entries in the credit and debit log each*
No limit is applied on the number of entries in the database as of now. However total space occupied by all the users combined is capped by 512 MB (due to limited cloud storage available).
- *History until at least 3 years ago should be available for generated bills and reports*
Automatic data cleaning is not implemented, hence if any cleanup required has to be done manually. Hence no data is removed by the system itself no matter when the data was created.
- *Preview bill and Generate bill functionality (i.e., the creation of pdf and showing it on web) should not take more than 6 seconds, provided the user has a stable internet connection.*
Time was noted for pdf creation using Chrome DevTools on various pages - Invoice and Transaction History. Following images show screenshots for one of the tests. Maximum time over multiple test cases never exceeded 5.5 sec for Generate bill, and 3.5 seconds for Preview bill and View Invoice.



Time taken by Preview bill and Generate bill on Invoice page.



Time taken by View Invoice (clicking on invoice ID) on Transaction History page.

2. Safety and Security Requirements:

- The software authenticates the user during login using a strong password. A strong password would require at least 8 characters.
In the Sign-up page we put a restriction of at least 8 char on the password field, without fulfilling this requirement signup is not allowed.
- There is a provision to set a new password in case the user forgets the password. In such a case, authentication is via OTP (One Time Password) sent to the user's registered email. The OTP shall be valid for 2 minutes. A similar procedure is followed for password reset.
To validate the OTP-based password reset functionality as per the specified requirement, we tested it manually. The system's ability to generate unique OTPs and deliver them to users' registered email addresses was confirmed after testing, along with verification of the OTP validity period set at 2 minutes. The complete password reset process, from user-initiated requests to OTP-based verification, was tested, covering different edge cases such as different email is provided which is not registered , wrong OTP entered , OTP entered after 2 minutes. Each time our deployed website behaved as expected, maintaining the security. Additionally, security measures implemented for OTP generation and transmission were evaluated like OTP should be very random each time. Throughout testing, no bugs or issues were encountered, affirming the reliability and effectiveness of the OTP-based password reset feature, which provided users with a secure and seamless password recovery experience.
- Passwords are stored securely by hashing so that even the administration can only verify if the password is correct without discovering the password.

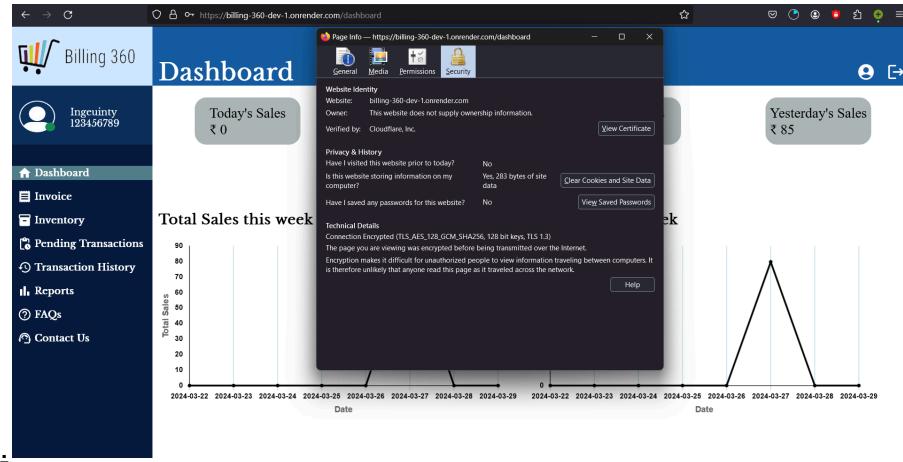
```

_id: ObjectId('6603f24e9e6b1e0a4d4f389b')
firstname: "Doraemon"
lastname: "Gupta"
email: "kundank22@iitk.ac.in"
password: "$2b$10$fe6hrH15leN8mk7oiQLJB062DSpMtM8dPjUz1uzqUmeyeueQIenqgC"
gstno: "ABGH"
shopname: "Gian Shop"
shopaddress: "School ki pechhe wali pahar"
phonenumer: "1234567890"
__v: 0

```

As can be seen in the database, password is stored in a secure manner by hashing. Even the admin doesn't know the user password. Keeping the user's privacy maintained.

- All connections to the server should use Transport Layer Security (TLS 1.2/1.3) encryption. All transaction data should be encrypted properly.



- This is from our deployed website. As can be seen from the screenshot , the site uses TLS 1.3. Therefore all the communication happens between server and client securely.

3. Maintainability:

The software has been designed in an organized manner so that new features can be added and modifications can be done very easily within two working days. Various components of the software are well organised into folders and comments are added wherever required streamline future improvements.

4. Reliability:

The system operates with remarkable robustness, consistently delivering reliable performance. The anticipated downtime of the website is significantly minimized, ensuring uninterrupted accessibility for users. This reliability enhances the overall user experience and fosters trust in the website's functionality.

5. Scalability:

We've tested the system with 15-20 concurrent users and it performed well. However, to accurately gauge its scalability, it needs to be made available to the general public. Only through widespread usage can we gather sufficient data to assess its performance under higher loads.

6. Portability:

Being a web-based app, the software is easily accessible from any device with browser support. We tested the deployed website, and it works perfectly fine on Google Chrome, Mozilla Firefox and Microsoft Edge web browsers.

5. Conclusions

- **How Effective and exhaustive was the testing?**

Testing was done almost exhaustively. Each API underwent testing to ensure that they were modifying the database and returning the desired information when needed. We have taken care of all cases, thus ensuring complete branch coverage. The frontend was also tested and bugs were resolved. Validity of each input has been checked in all forms. Appropriate alerts have been shown in such cases. Edge cases were also tested and were confirmed to work as expected. For example, when the entered start date is ahead of the entered end date while viewing reports, an alert is displayed preventing the user from dealing with such invalid inputs.

The testing was quite effective. A developer tested a component that was not developed by him/her. Every component was tested by atleast two developers.

- **Which components have not been tested adequately?**

Our test coverage for non functional requirements outlined in the SRS document could be further expanded. Perform tests adequately for non-functional requirements like reliability, maintainability and ease of learning could not be performed.

- **What difficulties have you faced during testing?**

The main difficulty faced during testing was ensuring non-functional requirements are satisfied, in system testing.

- **How could the testing process be improved?**

The testing could have been improved by doing the unit testing or integration testing as automated rather than manual. The developer might subconsciously assume a few crucial things which may be not so obvious to an end-user or someone who was not involved in the development of the software.

Appendix A – Group Log

Date	Timing	Duration	Agenda
22/03/2024	12:00 - 14:00	2.5 hours	<ul style="list-style-type: none"> Discussed various types of testing. Distributed the tasks of various types of testing among subgroups within the team.
24/03/2024	14:00 - 16:00	2 hours	<ul style="list-style-type: none"> Discussed the various doubts faced by each subgroup in their respective tasks.
26/03/2024	11:00 - 13:00	2 hours	<ul style="list-style-type: none"> All the group members met in an online meeting. Every subgroup updated each other with their work.
29/03/2024	15:00 - 16:00	1 hour	<ul style="list-style-type: none"> Discussed doubts among team members.
31/03/2024	20:30 - 23:00	2.5 hours	<ul style="list-style-type: none"> Reviewed the testing document. Cleared various doubts in the testing document. Finalised the testing document.