BAHIR DAR UNIVERSITY

BAHIR DAR INSTITUTE OF TECHNOLOGY

FACULTY OF COMPUTING

DEPARTMENT OF SOFTWARE ENGINEERING

COURSE TITLE: Software Evolution and Maintenance

COURSE CODE: SEng4144

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1. Problem/modification identification, classification, and prioritization

This system needs a different type of maintenance especially perfective addition Corrective maintenance since it should support different types of services related to providing convenient and quality services for Customers such as table reservations, special food orders, and detailed information about the restaurant

Major Categories of changes that should be Implemented

- User Authentication and authorization should be added
- Add a backend to the website
- Ui/Ux modification
- Bug fixing and using third party packages
- Adding new Services like table reservation and special food order

Detail modifications to implement are the following: -

- VIP clients prefer to reserve a table before arrival
- Clients with food dispositions and most VIP clients like to notify special orders
- Login page should be added to the website
- signup page should be added to the website
- adding new content and feature to the website
- Adding new pages
- Email verification when a new user arrives
- Using the latest technology like HTML5, CSS3, ES6, Bootstrap, and font awesome
- Replace Graphics i.e. Pictures
- Adding Database to the website
- Use additional API
- Add page for Announcements, Blogs, Articles, Company News…. etc.

Classification of change requests

Change requests assigned to perfective maintenance

- Adding table reservations and special food order Service
- Adding Database to the website
- Adding new pages
- Additional API integration
- Add page for Announcements, Blogs, Articles, Company News…. etc.
- Email verification when a new user arrives

Change requests assigned to Corrective maintenance

- Bug fixing and using third party packages
- Using the latest technology like HTML5, CSS3, ES6, Bootstrap, and font awesome

- Replace Graphics i.e. Pictures and videos

- Ui/Ux modification
- Adding appropriate website description

Assign Priority

Corrective change requests should be maintained first. The following table depicts the priority type of maintenance and other feature of change requests.

CR	ID	Type of maintenance	Status	Priority
Bug fixing	1	Corrective	Accepted	High
Ui/Ux modification	2	Corrective	Accepted	High
Additional website description	3	Corrective	Accepted	High
Using the latest technology	4	Corrective	Accepted	Low
Adding Database to the website	5	Perfective	Accepted	High
Adding Login page	6	Perfective	Accepted	High
Adding Signup page	7	Perfective	Accepted	High
Adding table reservations and special food order Service	8	Perfective	Accepted	High
Email verification when a new user arrives	9	Perfective	Accepted	Low
Additional API integration	10	Perfective	Rejected	Low
Add page for Announcements	11	Perfective	Rejected	low

Table 1. 1 Prioritized Change Request List

2. Analysis

Based on the information from previous Sections the following change requests are accepted

- Bug fixing
- Ui/Ux modification
- Additional website description
- Using the latest technology
- Adding Database to the website
- Adding Login page
- Adding Signup page
- Adding table reservations and special food order Service
- Email verification when a new user arrives

Feasibility analysis

Ui/Ux modification: - To make The Website more interactive and user friendly The user interface should be modified according to the target audience .this requires design and implementation skills from the maintenance team as well as an additional resource but without extra cost. implementing this change will make a simple and easy to use website with numerous features to offer.

bug fixing: -This change request can be implemented with less effort by identifying bugs in CSS and js modules and also in index.html using static code analysis. Implementing this change request will make our website more reliable, fast, and secure

Additional website description: - this feature must be included as it provides a much-needed description of the website and the services it offers, this requires the maintenance team to do research and write descriptions of the website features .this will provide users a simple and intuitive experience interacting with the website

login and sign-up pages: - This change request requires a little more effort when compared to the others as it requires a lot of programmers working on it and also, we need to consider security implications that come along as it is an authorization process. Implementing this change request allows us to authenticate and authorize users and provide more private and personalized services that we cannot do otherwise.

adding new services: -These change requests include adding new important services like allowing users to reserve a table and provide the order directly to the chef if they are customers that have food dispositions like allergies and for VIP customers who prefer to make a private order. Implementing this request requires more effort as it includes designing, architecting, and implementing the new service.

Impact analysis

Ui/UX Modification: changing the user interface of the site wouldn't have any impact on the rest of the system's service.

Bug fixing: the bug fixing would not have that much of an impact on the rest of the system. This is because the bugs we are going to fix are minors and they won't result in a significant change in the system.

Login and sign-up page: implementing this change request will result in a significant impact on the system because we are adding a completely new feature that our website didn't have before.

Adding new services: adding new services will have a significant impact because this will cause the system architecture to change as it is new functionality.

Website description: this won't have a significant impact as it just adds additional information to the website to elaborate our services and express the website's purpose

Updated requirements (including traceability list)

The following are the requirements the existing system has.

- Allow users to see the food menu
- Provide a profile for chefs
- Provides a food gallery
- Has a form where people can tell how they feel about the website
- Have an elegant and attractive hero looks

U**pdated requirements (requirements for the newly implemented system) are:**

The following are updated requirements:

- The system must have a login page where we can authenticate our users
- The system must have a signup page that allows them to register for our services
- The website should allow users to reserve tables
- The website should allow users to provide orders directly to a chef they prefer
- The user interface should be modified to make the user experience better and to improve user satisfaction
- The website must have a database integrated into it to allow us to accept user order

Value of the benefit of making the modification

Adding login and sign-up page for user: -

Adding a login and sign-up provides a tailor-made user experience where the user preference is easily available and secure. This service provides service to the user to log in and accesses specific services like table reservation and making special food request to specific chefs while protecting their data and unanimity

Adding tables reservation: -

Adding table reservation service provides a user to have the option to choose where to sit when they come to the restaurant which enables users to have ease of mind knowing that they will not have to wait for a table to be available and some VIP clients prefer a table that is out of sight to be able to have more personal experience. This makes users fill at home and enables the restaurant to have better customer satisfaction and bring in more clients.

Adding service of placing special orders:

Adding service for placing special orders provides customers to tell the chiefs their food references this feature mostly benefits customers that would like to place special orders for a variety of reasons which could be different food allergies, customers that please a bulk orders for different events, and VIP clients with a specific languorous food choices

Making Modifications to UI/UX:

Modifying the current user interface will help by enabling the website to appeal to the target audience that uses the service. having an easy, intuitive, and attractive user interface enable users to complete their task easily and with the added caveat of having an appealing user experience that compliments their culture and background

Adding database integrated:

Adding a database enables to record and organizing of customer data more efficiently so that when need during authentication and authorization it can be accessed securely and with ease of use.

The system didn't have a database. It didn't even have a proper backend so we incorporated the database and a backend

3. Design

Identifying affected software modules

Authorization and authentication module: A user can register and log in to the system in order to access special features like table reservations and placing a special order to the chef where the order is sent to the specified chef via email. A database is implemented in this module to record user information and to fetch user data to Authorize and authenticate when logging in.

Schema structure for the user table:

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	user_id	int(20)			No	None		AUTO_INCREMENT	Change Drop More
2	user_name	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
3	full_name	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
4	user_phone	varchar(10)	utf8mb4_general_ci		No	None			Change Drop More
5	user_email	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
6	user_city	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
7	user_role	varchar(20)	utf8mb4_general_ci		No	None			Change Drop More
8	user_gender	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More
9	date	datetime			No	None			Change Drop More
10	password	varchar(50)	utf8mb4_general_ci		No	None			Change Drop More

Figure 2. 1 Users Table Database Schema

Special Order Module: this module provides enables users to place a Special order of food according to their food specification and the Quantity they need including specifying ingredients that they want and don't want to be used.

Reserving Table Module: the module is added to provide users the option to choose a table to sit at while visiting the hotel according to their preference

Updated Design Baseline

This is the diagram showing the overall architecture of the newly modified system

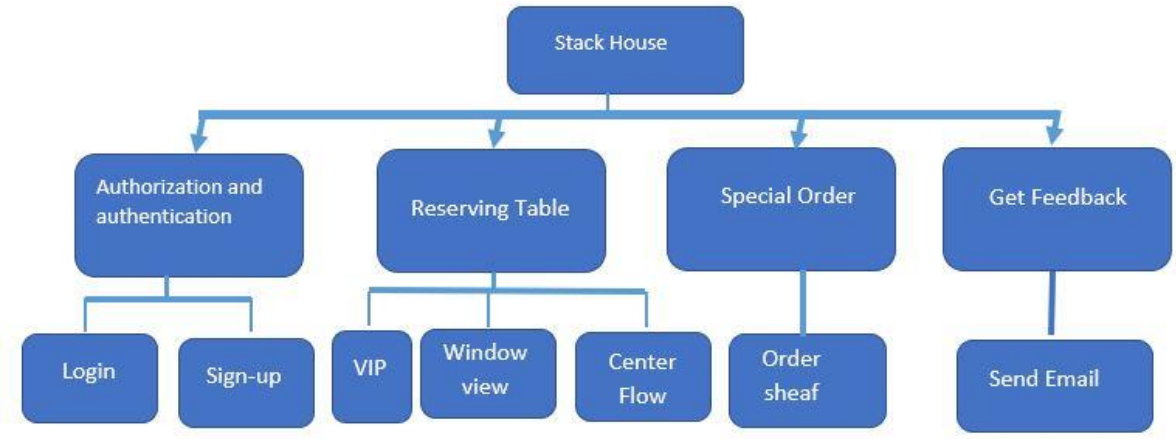


Figure 2. 2 Updated Design Baseline

Revised detailed analysis

When we analyze the system and maintenance requests the following reports are generated.

- The system should have a login and signup page for authenticating our users. This is to allow the users to authenticate themselves and to get special services like table reservation
- After analyzing the system we have decided that The website should allow users to reserve tables. we incorporated this service using a module called the table.
- After analyzing the system, we have decided that the website should allow users to provide orders directly to a chef they prefer. We incorporated this service using a module called the order.
- The system didn't have a database. It didn't even have a proper backend, so we incorporated the database and a backend

Verified requirements

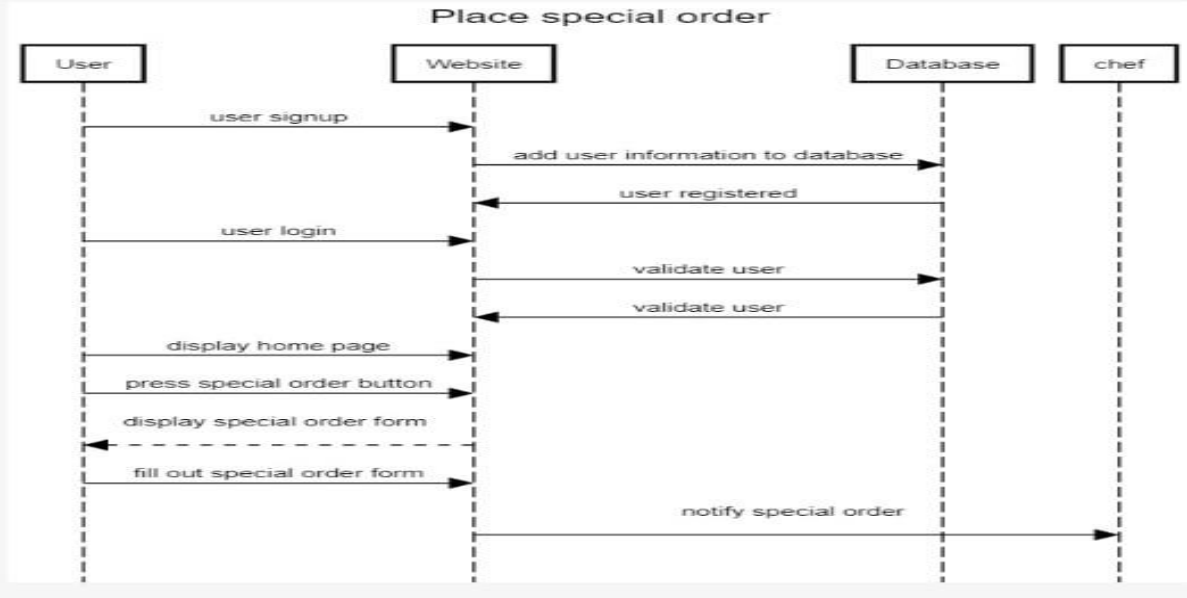
- The system should have a login page for authenticating our users
- The system must have a signup page that allows them to register for our services
- The website should allow users to reserve tables
- The website should allow users to provide orders directly to a chef they prefer
- The system should include e change user interface to make the system more interactive and user friendly
- The system should have an inefficient and secure database

Revised Modification List

- Table reservation
- Placing Special Order
- Login to the website
- Sign-Up to the website
- Valid Website description
- Email feedback

Revised plan for Implementation

sing the tools described we implement and maintain the change requests listed above. the



following sequence diagram shows interaction between a user and the new steakhouse website.

Figure 3. 1 sequence diagram for Special Order

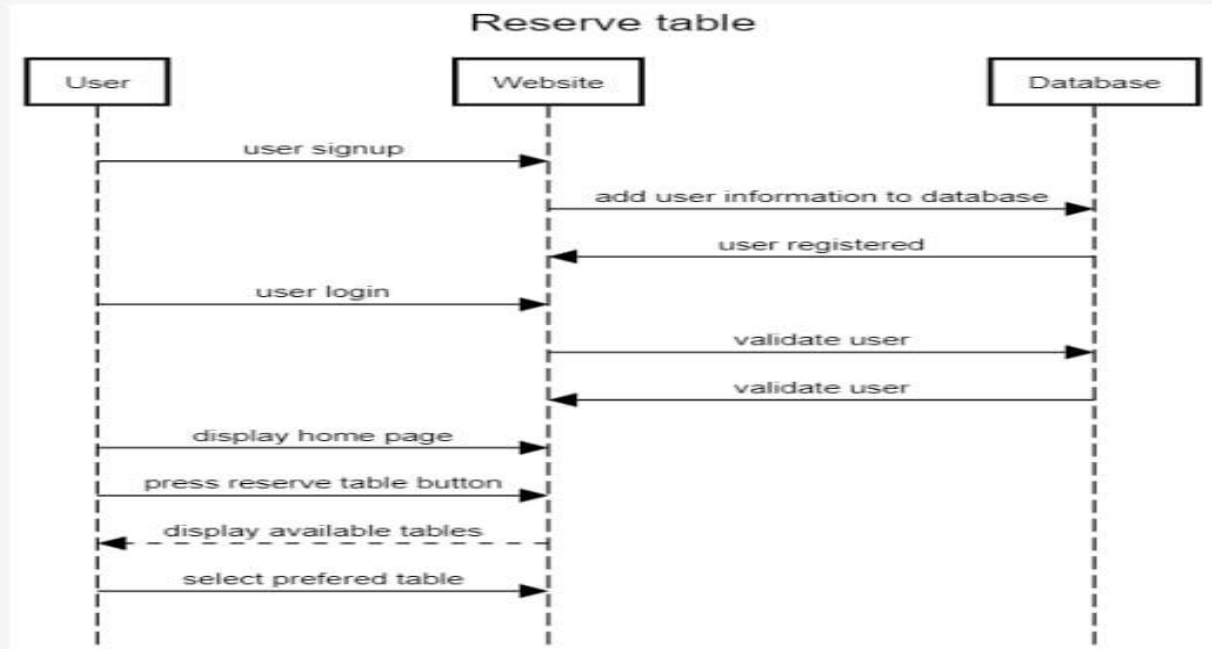


Figure 3. 2 sequence diagram for Table Reservation

The following changes Will Occur

- A login page is added for already registered users:

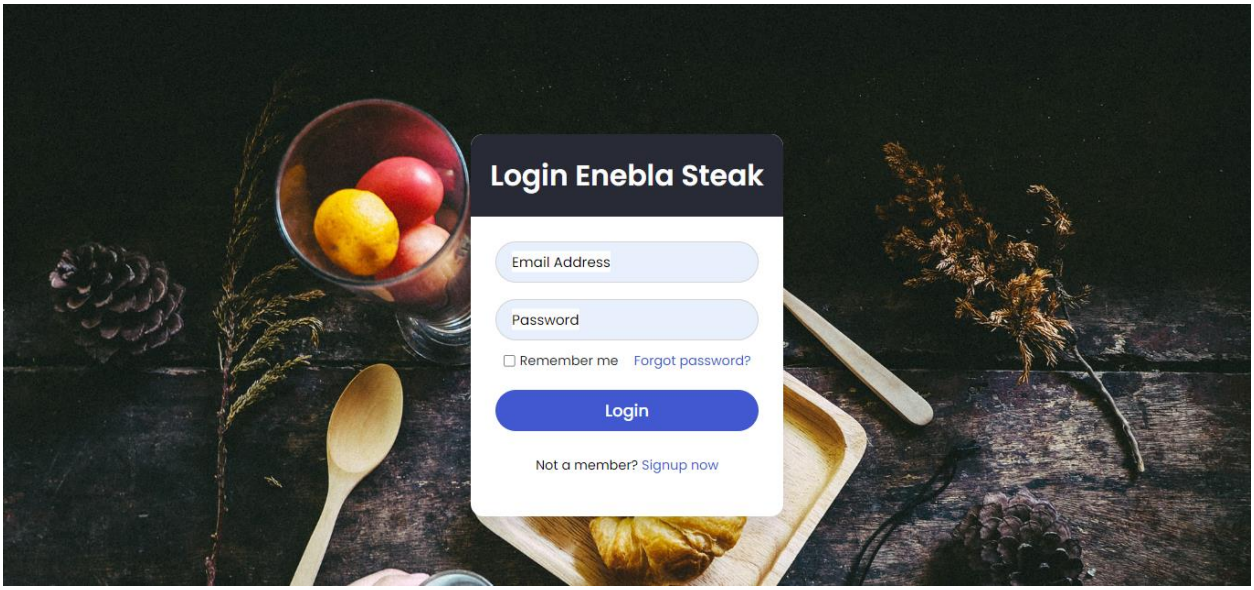


Figure 3. 3 The login page

- A Signup page is added for users that want to register users:

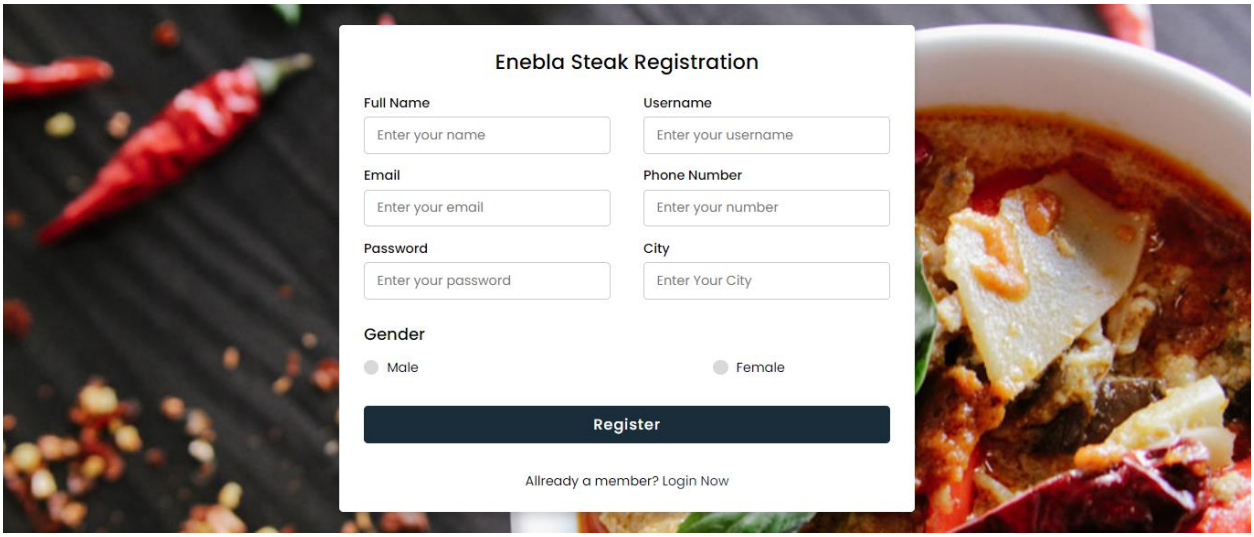


Figure 3. 4 Signup page UI

- A Table reservation page is added for users that want to reserve a table prior to arrival:

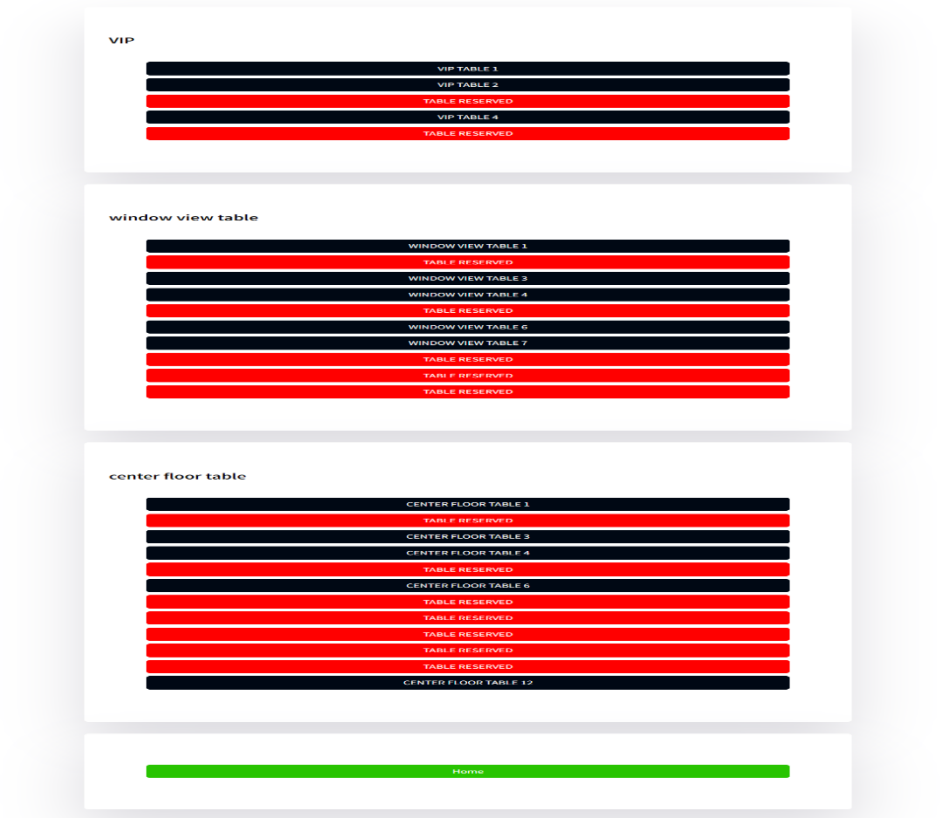


Figure 3. 5 Table reservation page to reserve Table

- A Special food Order page is added for users that want to order food with a specific preference and quantity:

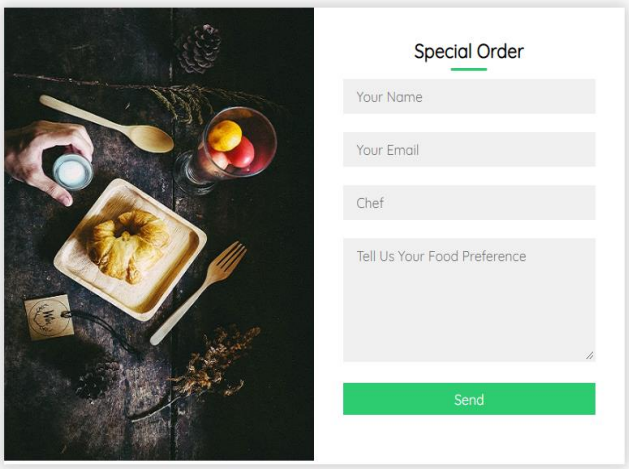


Figure 3. 6 Special food Order page

- An Email Notification feature to make notifying order to chef's simple and easy

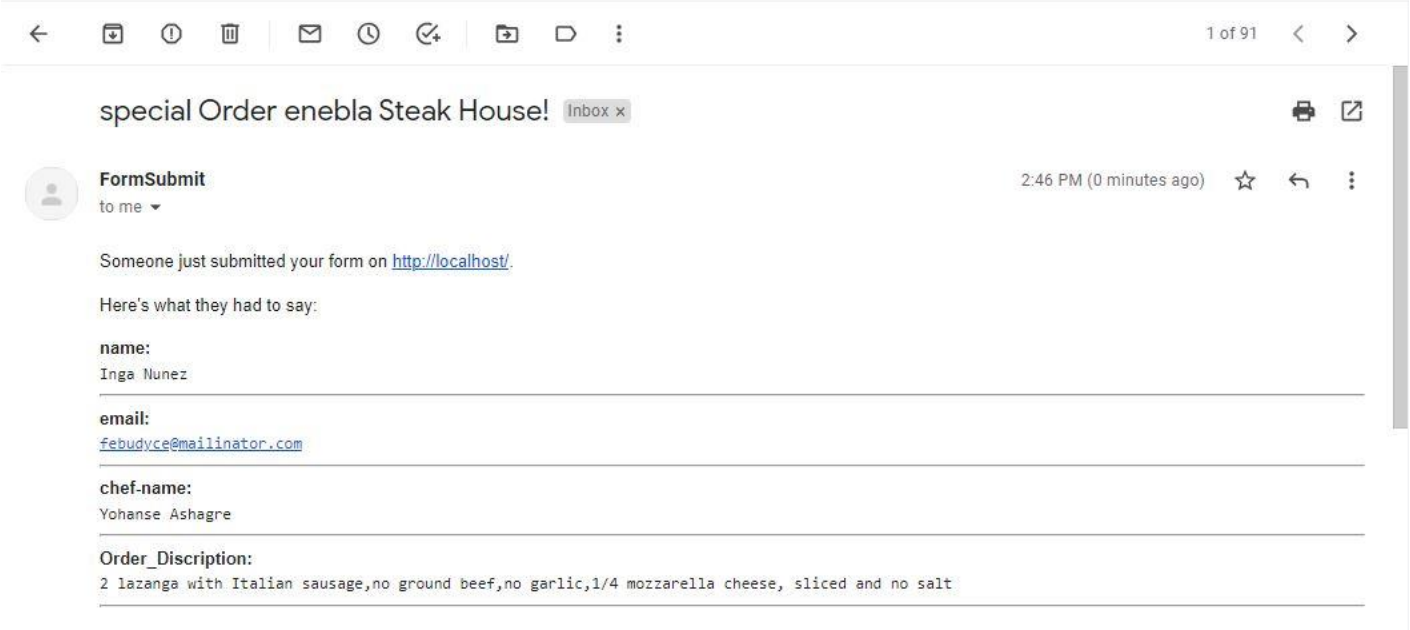


Figure 3. 7 Email Notification

4. Implementation

5. Regression testing

Regression testing is a part of system testing and shall be performed to validate that the modified code does not introduce faults that did not exist prior to the maintenance activity.

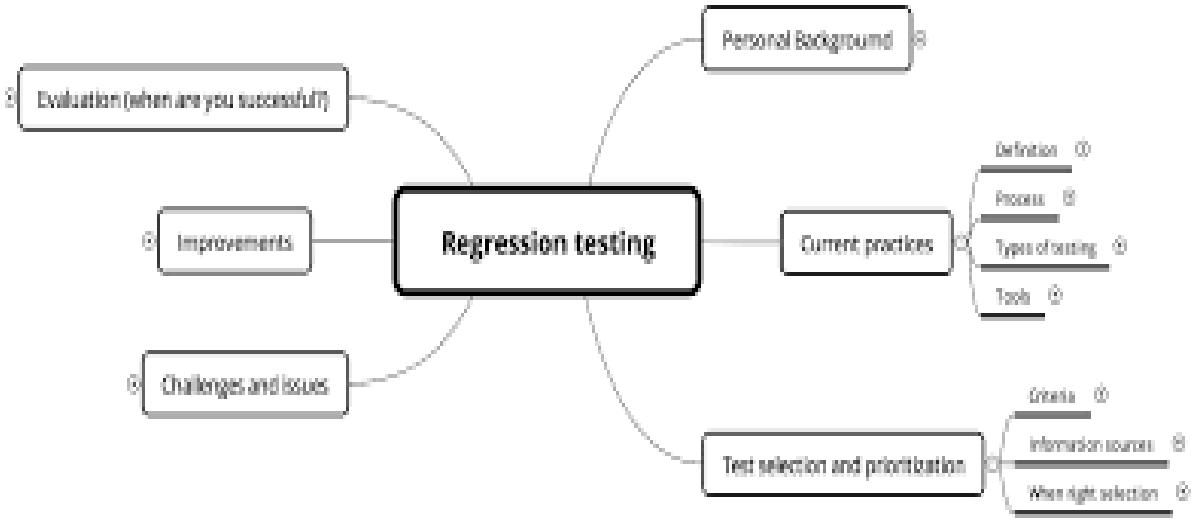


Figure 5. 1 Regression Testing

Test Case for Regression Testing

- To make sure that the website UI is responsive, and all graphics and text is visible and understandable
- After the Maintenance the website still works for the target audience
- Color scheme is consistent to the functionalities we added
- Content is written in a language understood by all the user

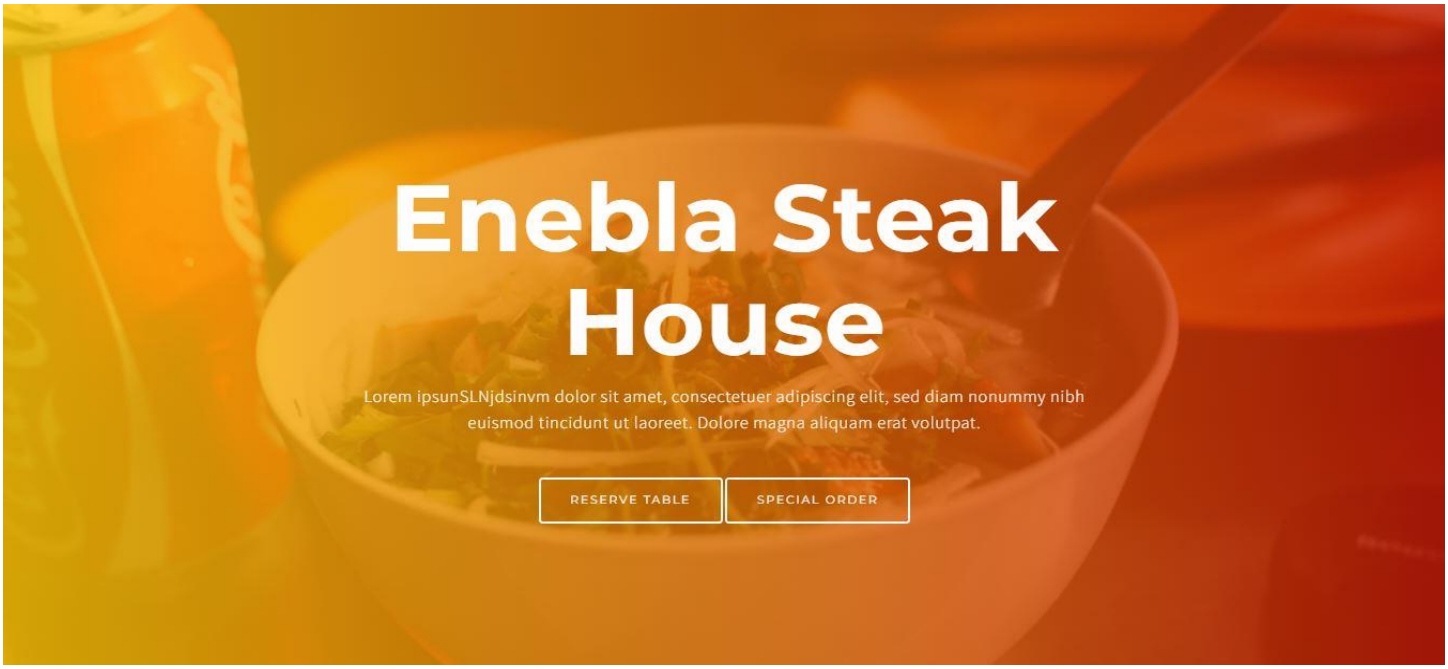


Figure 5. 2 Home page Enebla Steak House

- Scrolling down or pressing the Links in the navigation bar will display the rest of the content
- Responsive to different size of screen

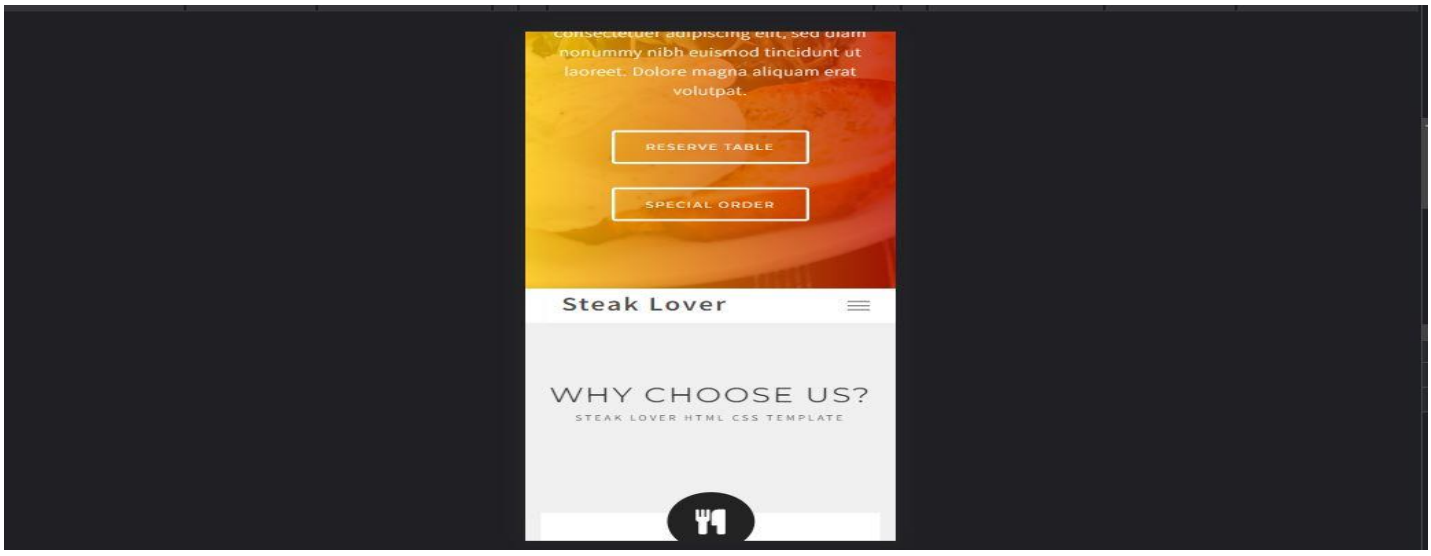


Figure 5. 3 Responsive view of the website

6. Acceptance Testing

User acceptance testing (UAT) consists of a process of verifying that a solution works for the user.It is not system testing (ensuring software does not crash and meets documented requirements) but rather ensures that the solution will work for the user (i.e. tests that the user accepts the solution); software vendors often refer to this as "Beta testing".

a) Does the sign-up page UI easy to understand and use?
b) Does the system show the correct number of tables?
c) Does the Special orders form enable to input all relevant data about our order?
d) Does the system login is suitable to use?
e) Does the website provide relevant information to user?
f) Does it notify users order to chefs ?

Specification	**Acceptance Testing**
A	Yes
B	Yes
C	Yes
D	Yes
E	Yes
F	Yes

Table 6. 1 Acceptance Testing

7. Delivery

The system is ready for delivery after the accepted change requests are implemented by the maintenance team and after the appropriate testing such as acceptance testing and regression testing is performed. After performing the above, we will notify our users that we have updated the system and what new feature the new version incorporates. Then we develop an archival version of the system for backup. Finally, we will deploy our system.

Conclusion

Finally, we can conclude that this website will have a profound effect on the company. As we mentioned above the system incorporates a lot of services including table reservations and providing orders to chefs directly among others. If we see this website from the Ethiopia context, we can use it for many restaurants in Addis Ababa and for the rest of the country. As Addis Ababa is the hub for global events there will always be lots of traffic and this website can help restaurants to facilitate their work by accepting orders and table reservations online. People want to avoid the hustle they go through for ordering food, and they hate the time they waste waiting for the food. So, in the next maintenance iteration, we are going to make an additional modification that allows user to make their order directly online and make payments online by providing them with appropriate payment options.

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