Software Design Description

for

<Online Trial System Shopping Website>

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1 Introduction

1.1 Purpose

The purpose of this Software Design Document (SDD) is to describe the system design and architecture of the online trial system in a shopping website. This document will help to communicate with the stakeholders the implementation details of the requirements mentioned in the Software Requirements Specification (SRS) report.

1.2 Scope

The document illustrates the complete design and implementation details of the Online Trial System. The focus of this report is to build a simple yet indispensable and innovative functionality in the e-commerce fashion market. All the details regarding the structures, flows, and designs of the components mentioned in the SRS report are clearly described below in detail. Following the design details mentioned in this report, it would be possible to create a working, maintainable and scalable prototype or initial test design of the trial system functionality. Hence, to be able to create the prototype or Minimum Viable Product (MVP), following the architectural designs, the use cases described in the SRS report should be implemented.

1.3 Summary

The online trial system for a shopping website is an innovative solution that aims to solve frequent problems encountered by customers during online shopping. The primary issue that results in multiple returns and dissatisfaction arises from the fact that potential customers may like a certain product on the website, however, they may end up not liking the product after receiving it as it may not complement their personality, style or other reasons. Before placing an order, consumers may utilise the system's cutting-edge online trial system function to make an educated choice about their purchases. With the help of this functionality, users not only save time but also avoid the inconvenience of returning or exchanging items due to size or fit mismatch. This functionality allows the users to create customised 3D dummies by entering their body dimensions after registering on the website. These dummies allow users to virtually try on various things by acting as virtual versions of the users. To make purchasing easier, the system offers a number of functionalities, divided in several components.

Users may register accounts using the User Registration component, and they can then build and store several customised dummies for later usage with the Dummy Creation component. Users may browse and choose products using the Item Browsing and Selection component, then use the Trial System component to try them on afterwards. The component Item Model Creation builds 3D models of the given objects and positions them on the selected dummy for viewing. Users can go on to the Payment component to make the transaction using credit or debit cards after they confirm their selection. For safe payment processing, the system interfaces to an outside bank system. Before completing a payment, users have the chance to examine the order information. A Chatbot component

also aids in the virtual shopping experience by responding to user questions and providing video instructions. Users can use the Issue Reporting component to let the admin know if they run into problems creating the dummy or if the supplied product's measurements don't match the trial system. The administrator can then handle and fix the stated problems. Additionally, the system has an admin management feature that enables the admin to add, amend, and remove website content.

All in all, by offering consumers a virtual trial system using the 3D model, thereby reducing size and fit difficulties, and guaranteeing a streamlined purchase procedure, this software solution seeks to improve the online shopping experience.

1.4 Identified stakeholders and design concerns

Stakeholder Identity	Role	Concerns
User	User is defined as the person who uses the system and exploits it, without interfering with its core functionality and underlying design. Examples- customers, logistics staff et cetera.	latest information updated inventory ease of navigation timely delivery
Website administrators	Website administrators are responsible for the upkeep of the system and ensure its smooth working. They also report the technical issues/problems to the development team	management of website adding/removing items resolving customer grievance customer service and support
Developers	Developers include designers and engineers who work on enhancing the functionality, appearance and speed of the website. They are also concerned with system integration with external systems like banking service and youTube API.	Development of website maintenance of the system on parameters: ● scalability ● robustness ● optimization ● performance
Bank System (external)	Bank System is responsible to ensure hassle-free and secure transactions, especially when dealing with sensitive information such as bank details.	Reliable connection Secure transactions

Application Program Interfaces (APIs) (YouTube in this case)	YouTube APIs is responsible for providing an interface to retrieve the videos	Low downtime seamless access to related content

Design Concerns

- UI Design: easy navigation
- UX Design: user-friendly interface with interactive features
- DBMS- creating a database capable of storing data under data integrity principles and help in quick retrieval.
- Performance and Scalability- the system should have low load time (preferably less than 3 seconds for every page requested) and should be able to handle increased load, especially during holiday and festival seasons
- Security- efficient integration with external bank system and also, ensure protection of user data, considering encryption for sensitive information like passwords and credit card details.

2 Glossary

APIs- Application Program Interfaces
DBMS- Database Management System

MVP- Minimum Viable Product
SDD – Software Design Description document
SRS – Software Requirements Specifications Report
UI- User Interface
UX- User Experience

3 Architectural Views

In this report, the architecture of software systems will be described based on the Logical View, Process View, Development View, and Deployment View, as suggested by Kruchten (1995)[1]

Logical View

The logical view shows the key abstractions in the system as object classes.

[1] P. B. Kruchten, "The 4+1 View Model of architecture," in IEEE Software, vol. 12, no. 6, pp. 42-50, Nov. 1995, doi: 10.1109/52.469759.

3.1.1 Class Diagram

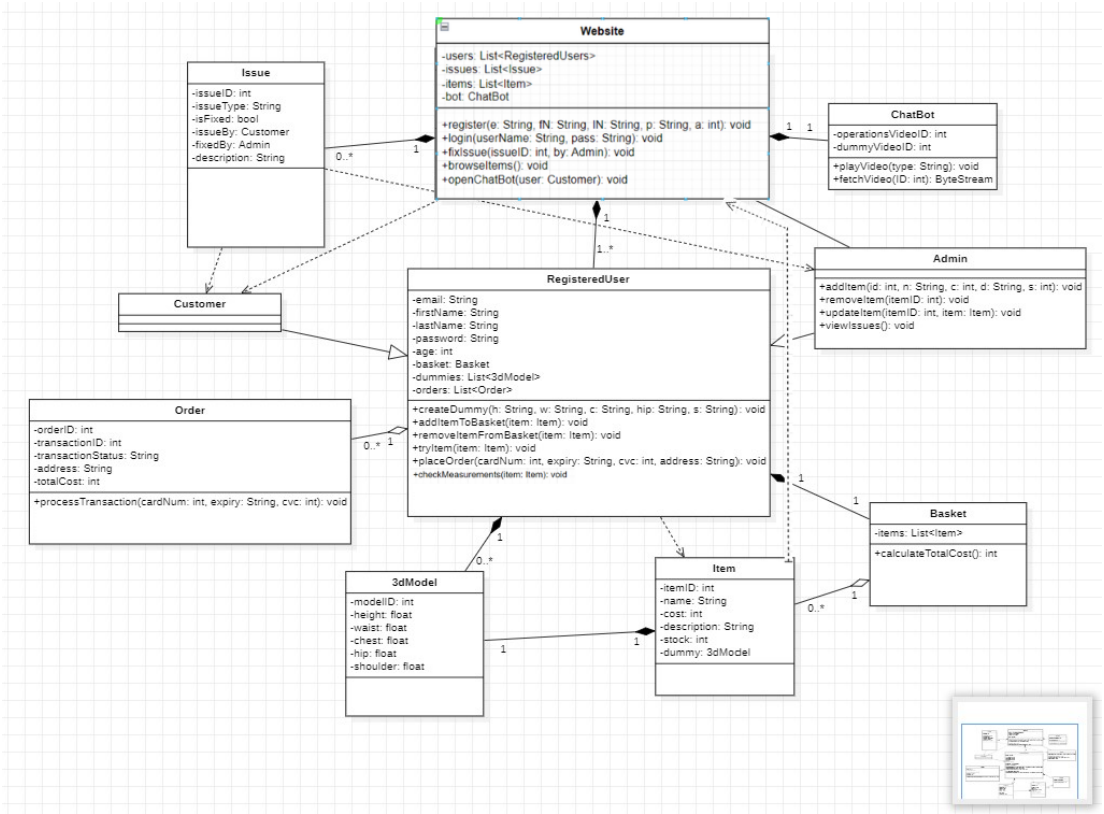


Figure 1: Class Diagram

Design Rationale: The classes are created according to the problem statement and it is made sure that each class represent a separate entity in our system, and all the relations are well defined.

Process View

The process view shows how the system is composed of interacting processes.

3.1.2 Activity Diagrams

User Registration Diagram:

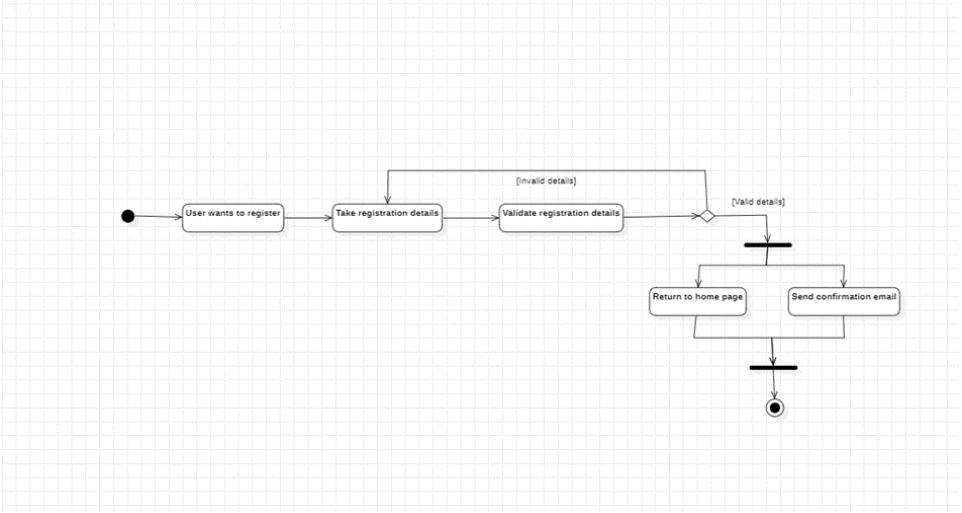


Figure 2.1: User Registration Activity Diagram

Design Rationale: The following diagram illustrates how a user can register him/herself into the system, the activity ends when the user enters valid registration details and is returned to home page after registration is complete, an email to confirm the registration is also sent simultaneously.

3D Model Creation:

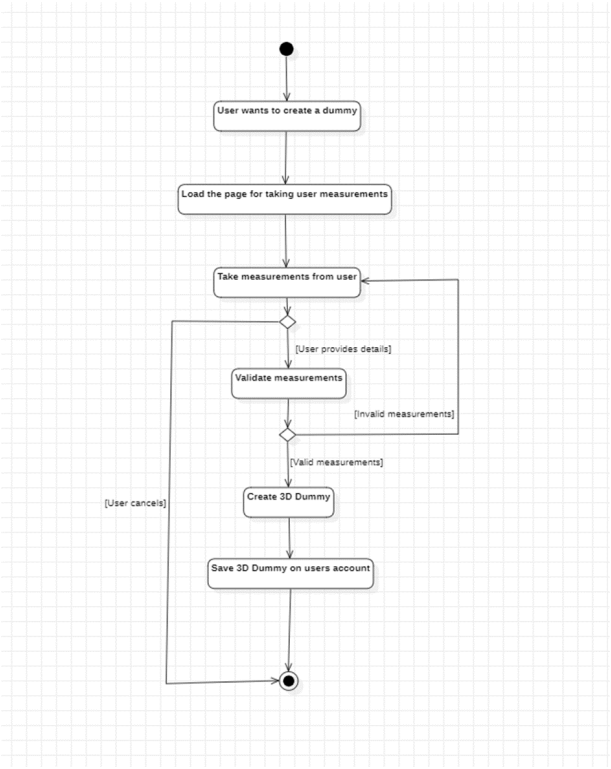


Figure 2.2: Dummy Creation Activity Diagram

Design Rationale: The following diagram illustrates how a 3D model can be created by taking the measurements from the user. The activity ends when the user validates the measurement and the system saves the 3D dummy model to his account.

Product Trial Diagram:

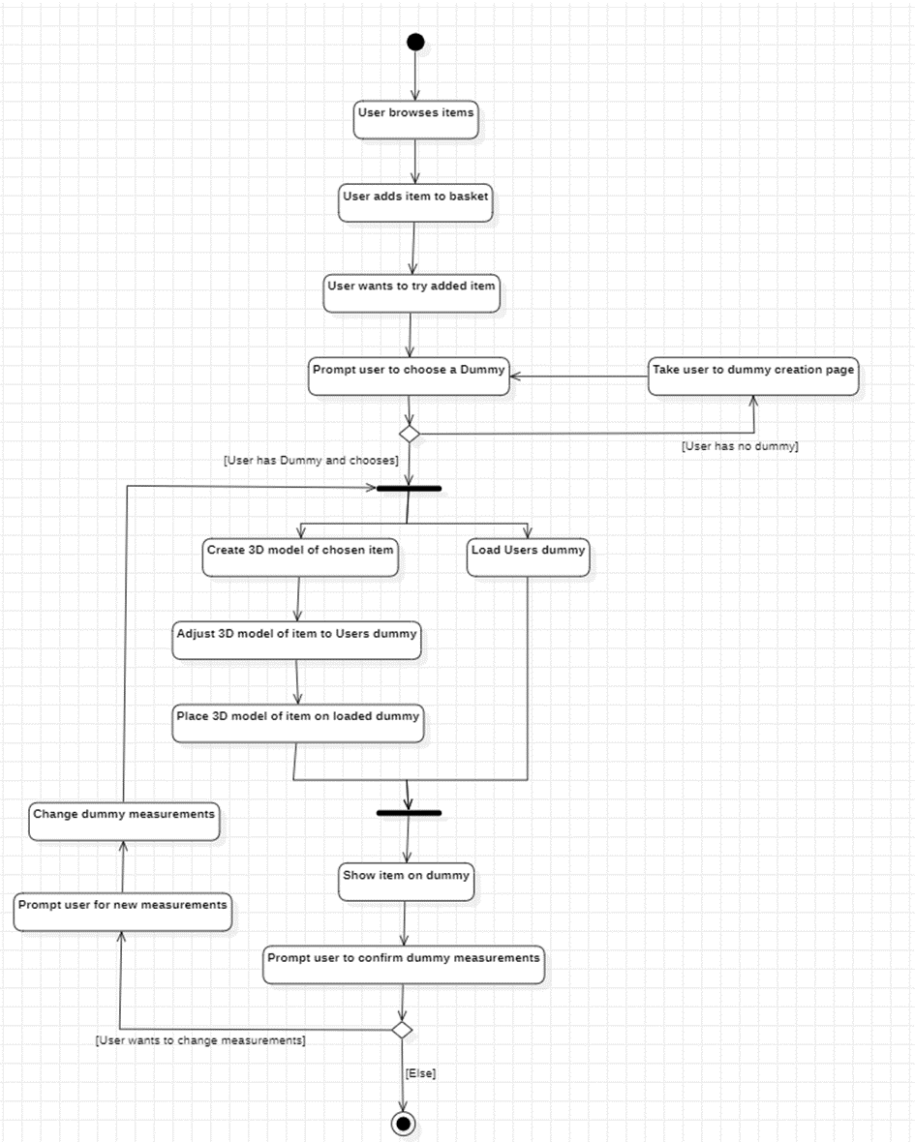


Figure 2.3: Product Trial Activity Diagram

Design Rationale: The following diagram illustrates how user chooses an item and creates a dummy when prompted, the activity ends with the user confirming dummy measurements on the created dummy.

Product Order:

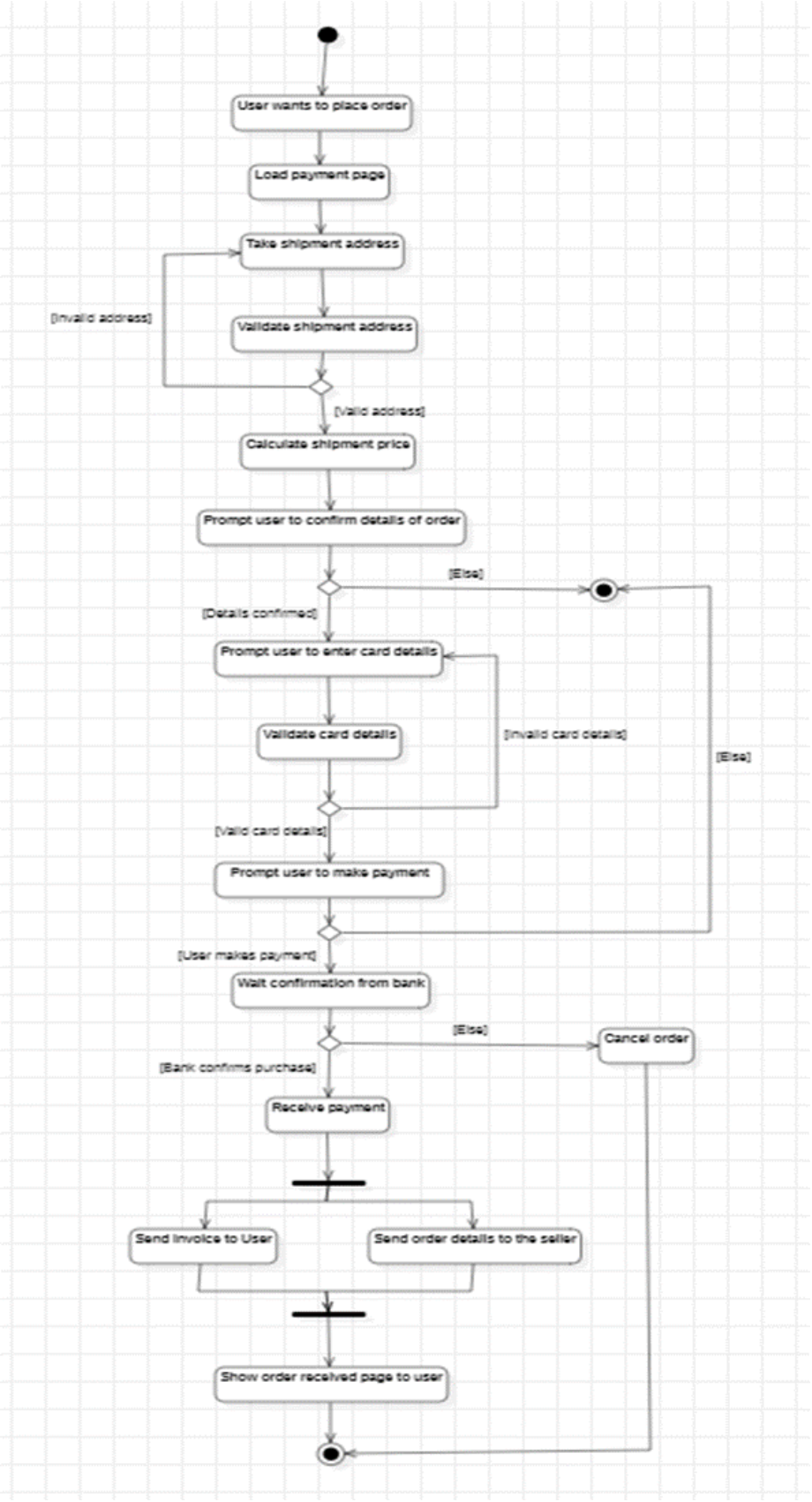


Figure 2.4: Product Order Activity Diagram

Design Rationale: The following diagram illustrates how a user can make an order on the system, it involves a series of steps which are all described in the diagram. The activity may end in three scenarios- when order is created successfully, when order is cancelled by the customer and when the payment is unsuccessful, leading to cancellation of the order.

3.1.3 Sequence Diagrams

Register: The following sequence diagram illustrates the steps followed by an unregistered user to be registered in the system. In this diagram, one can observe that there is only one actor which is the user, however, there are two screens, namely register and login screen. The controller acts as a medium of interaction in the system. And lastly, the database stores the registration details of all the users in the system.

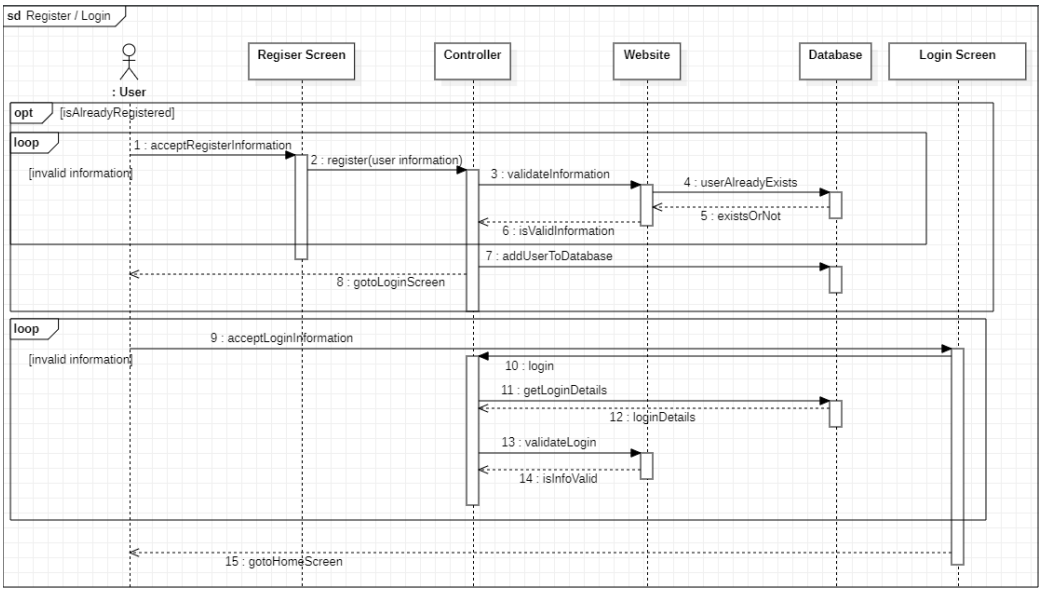


Figure 3.1: Register Sequence Diagram

Dummy Creation: The following sequence diagram illustrates the steps followed while creating a dummy. In this diagram, there are two loops, the outer loop creates several dummies, while the inner loop repeats until a dummy is saved by the user. Here, there is one actor, which is the registered user and two screens namely, dummy screen and confirmation screen. There is also a controller which facilitates the interaction between different objects.

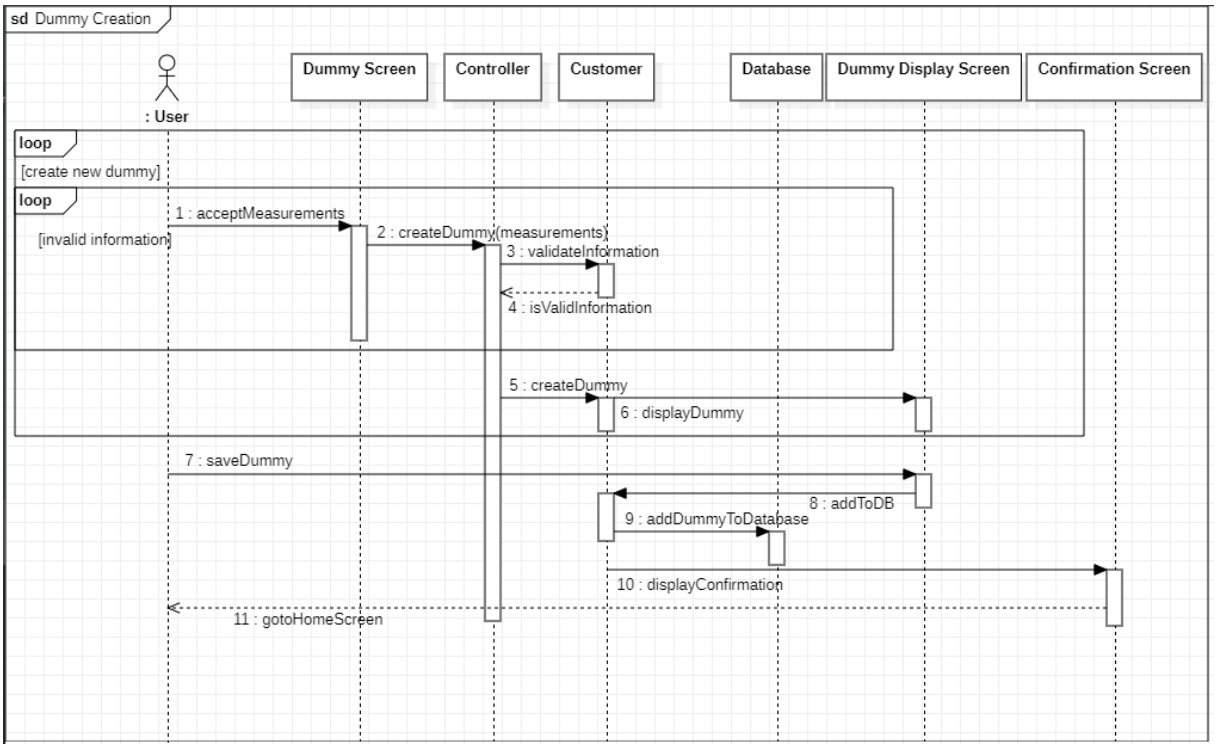


Figure 3.2: Dummy Creation Sequence Diagram

Browse Items: The following sequence diagram illustrates the steps followed while browsing the items on the website. In this diagram, there is an optional sequence for when the user wants to select the item and move on the further steps. Here, there is one actor, which is the registered user and three screens namely, browse screen, home display screen and confirmation screen.

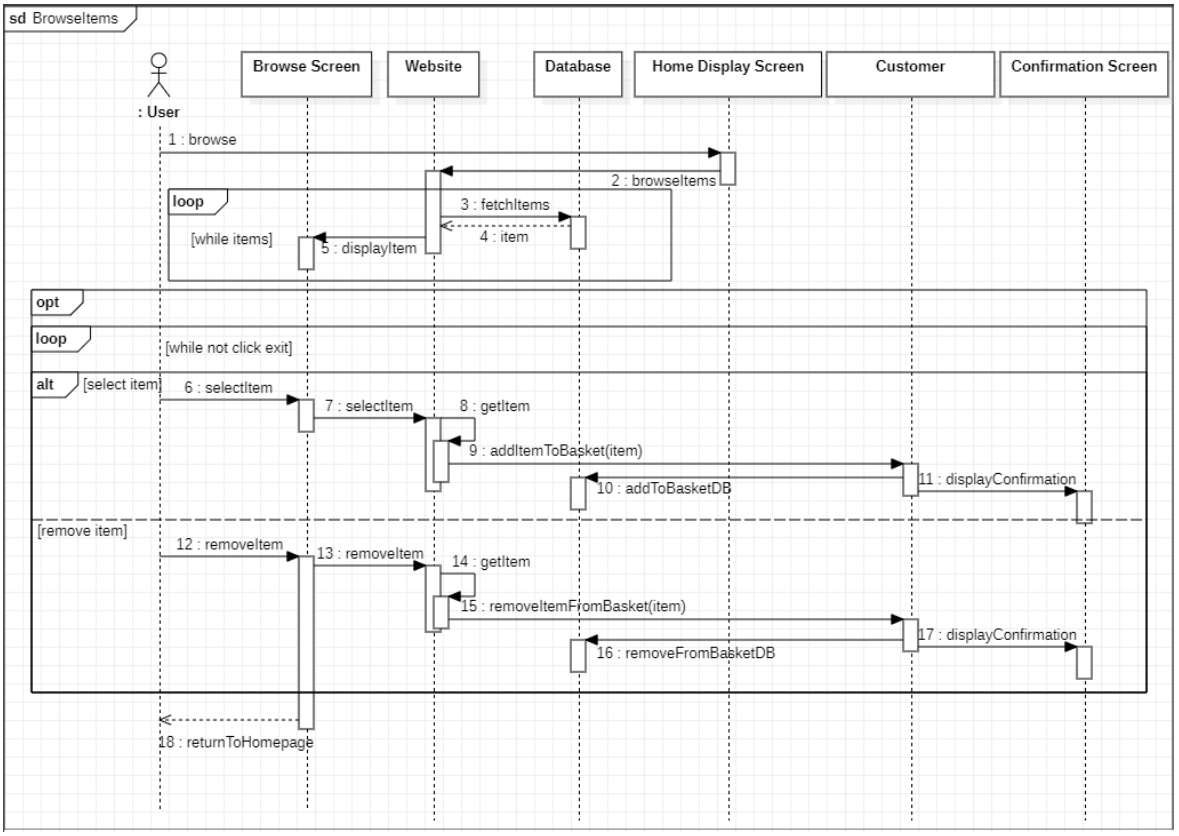


Figure 3.3: Browse Sequence Diagram

Try Items: The following sequence diagram illustrates the steps involved while trying the items on the dummy. In this diagram, there are two alternate scenarios, one is to try the item and other is to create the dummy before purchasing the item.Here, there are four screens namely, basket screen, home display screen, dummy selection screen and a prompt screen.

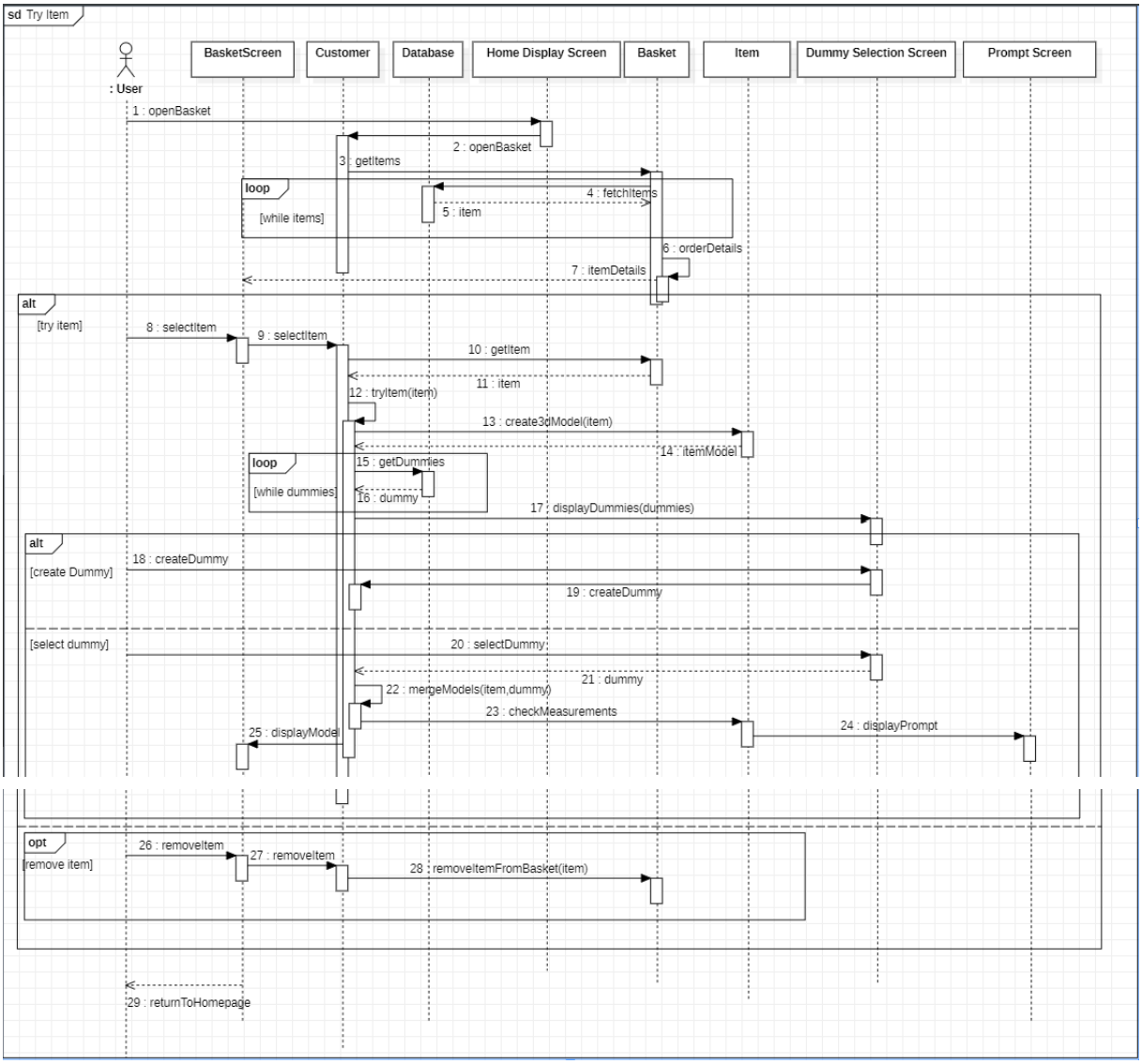


Figure 3.4: TryItem Sequence Diagram

Place Order: The following sequence diagram illustrates the steps followed while placing an order on the website. In this diagram, there is an inner loop for as long as the customer wants to add the items in the basket. And there is another loop to process the payment. There are three screens namely, basket screen, home display screen and payment screen. Furthermore, there is also an external entity, the Bank, for validating the payment.

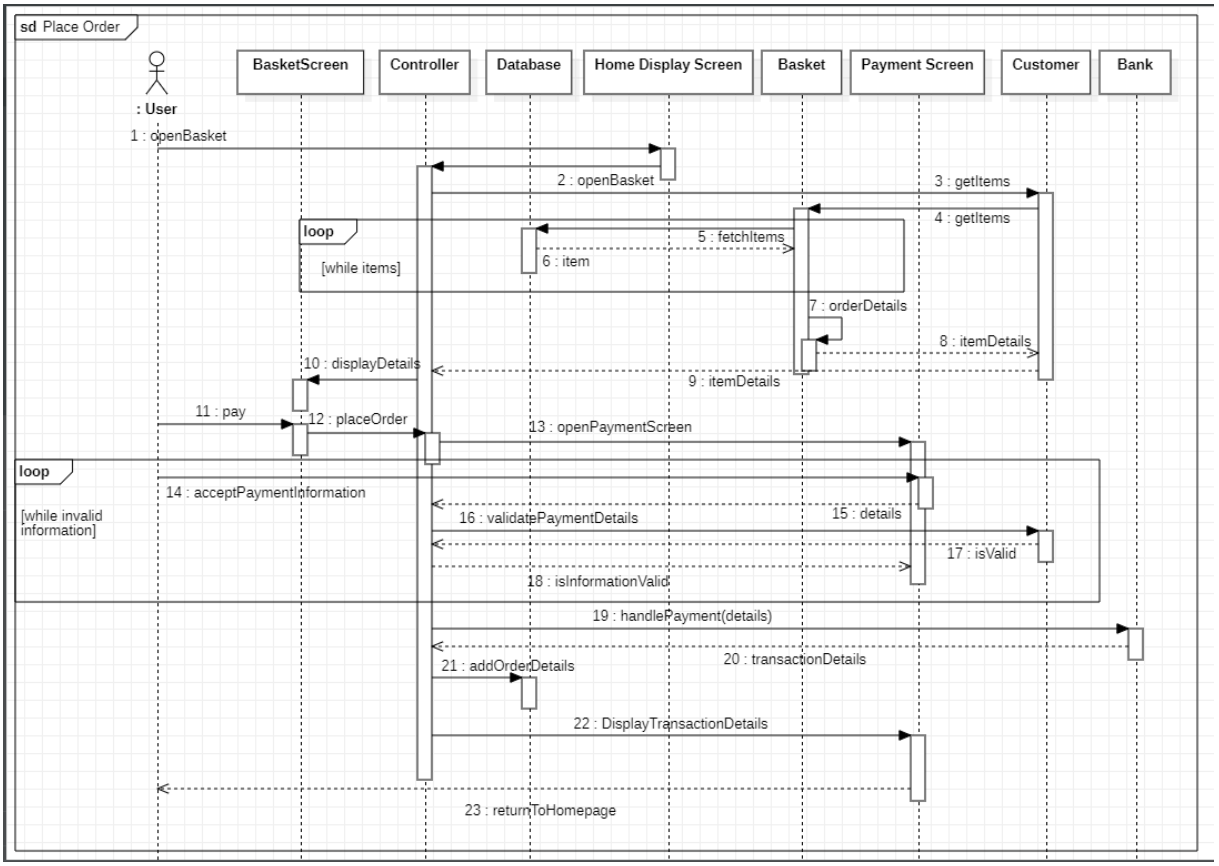


Figure 3.5: Place Order Sequence Diagram

Chat Bot: The following sequence diagram illustrates the steps followed while interacting with the chatbot on the website. In this diagram, there are two screens namely, chatbot screen and home display screen. Besides, the chatbot interacts with the YouTube API to fetch the related videos.

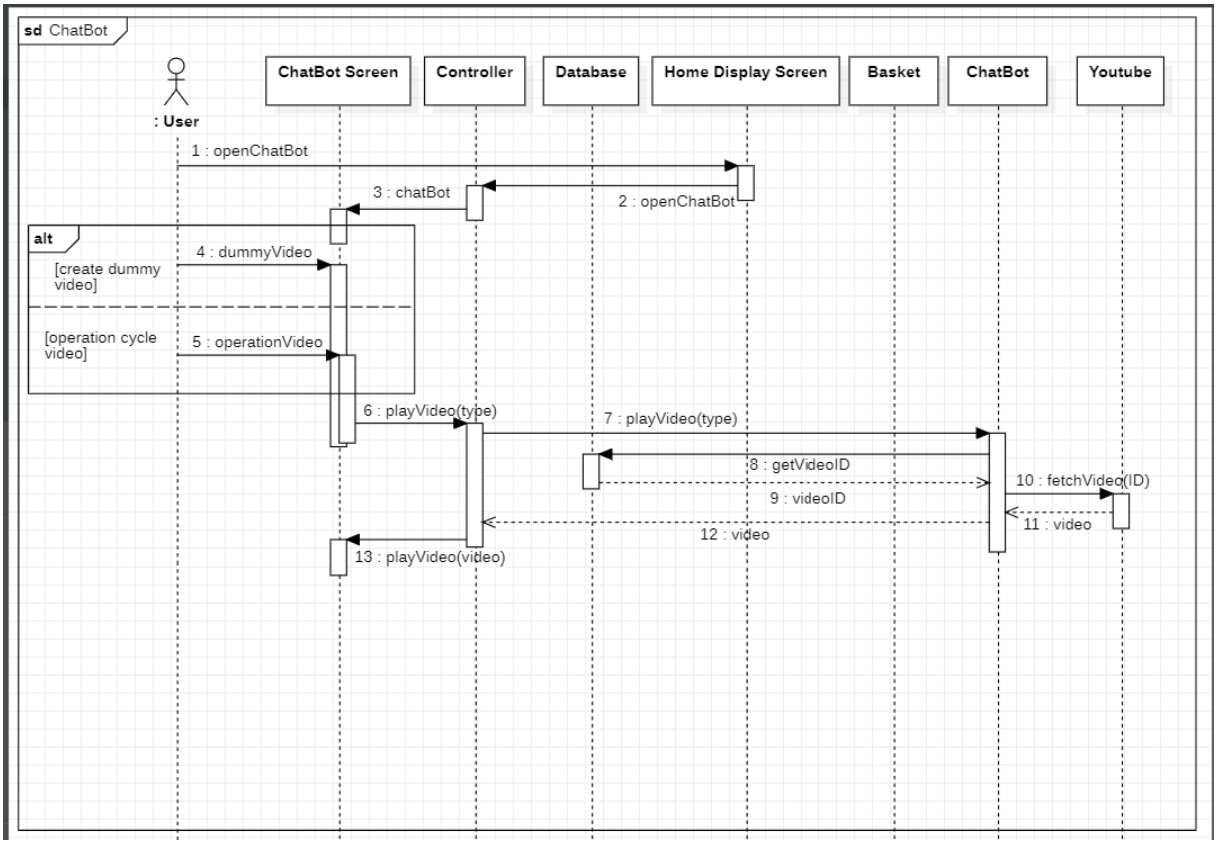


Figure 3.6: Chatbot Sequence Diagram

Submit Issue: The following sequence diagram illustrates the steps followed while submitting the issue faced by the user. In this diagram, a user must fill in the issue form. Here, there are two screens namely, home display screen and confirmation screen. Besides, everytime an issue is created, an alert is sent to the admin.

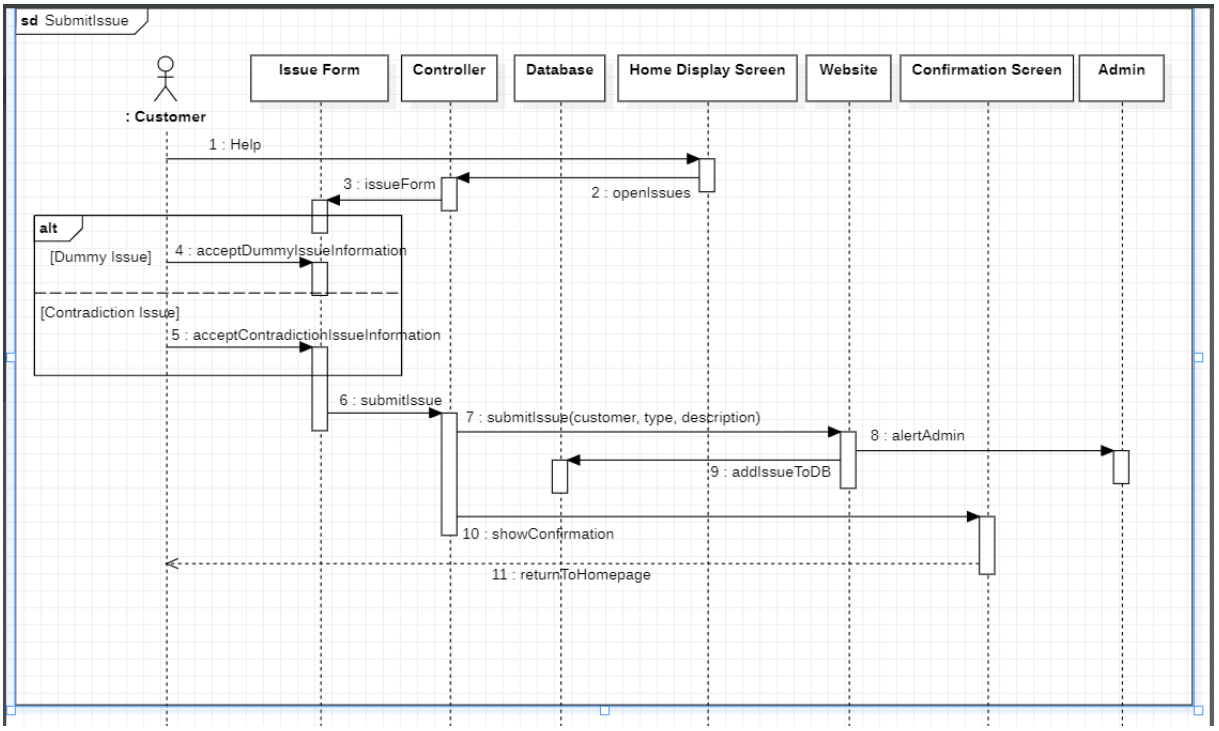


Figure 3.7. SubmitIssue Sequence Diagram

Fix Issue: The following sequence diagram illustrates the steps followed while browsing the items on the website. In this diagram, there is an optional sequence for when the user wants to select the item and move on the further steps. Here, there is one actor, which is the registered user and three screens namely, browse screen, home display screen and confirmation screen.

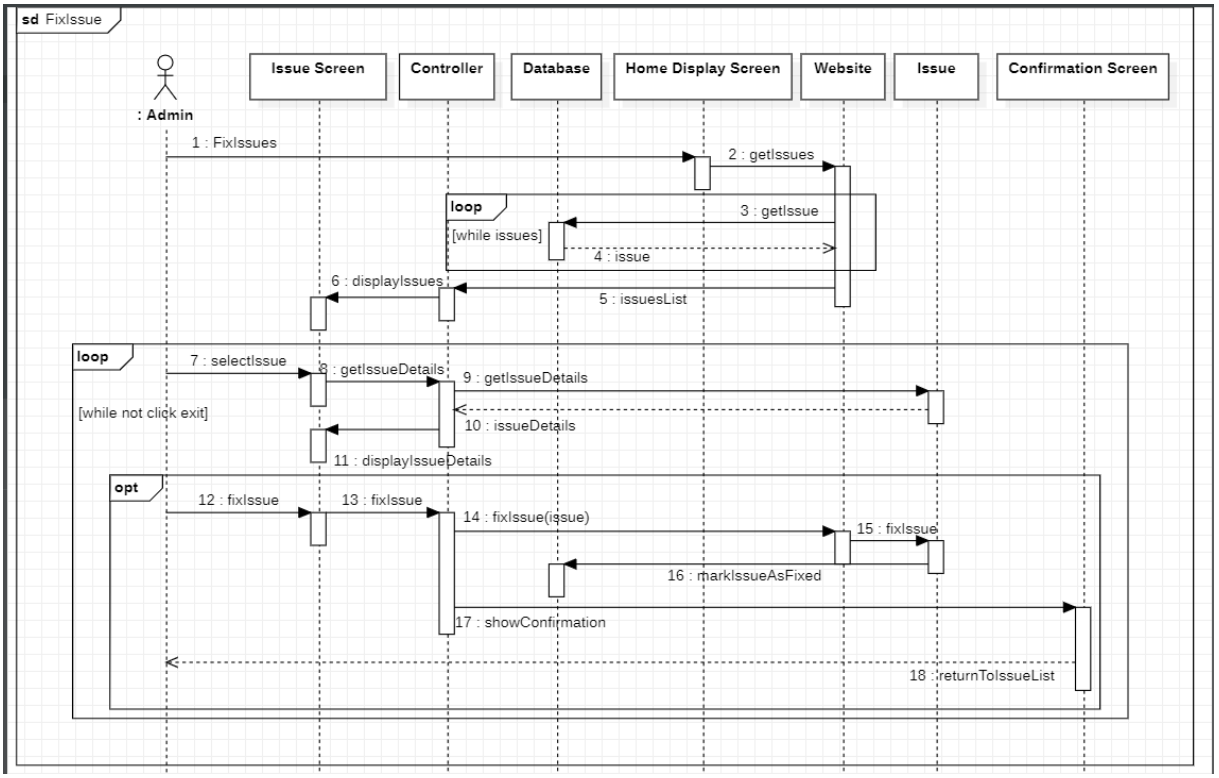


Figure 3.8: FixIssue Sequence Diagram

Admin add item: The following sequence diagram illustrates the steps followed by the admin when adding items on the system. The admin interacts with the system with the help of the controller, everytime an item is added in the system, it is added to the database which stores the inventory. Here, there is one actor, which is the admin and two screens namely, home display screen and confirmation screen.

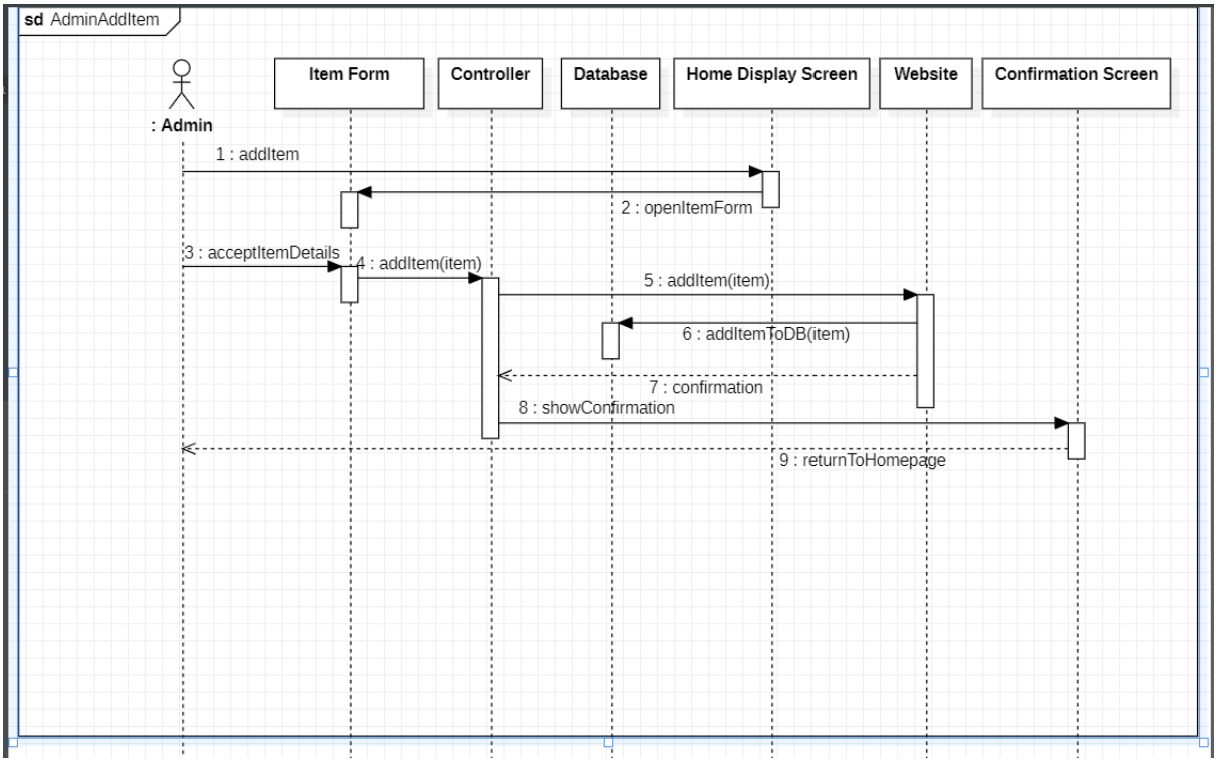


Figure 3.9:AddItem Sequence Diagram

Admin remove item: The following sequence diagram illustrates the steps followed by the admin when removing the items from the system. In this diagram, there is a loop which helps admin to remove multiple items. The admin interacts with various objects through the controller. Here, there is one actor, which is the admin and three screens namely, items screen, home display screen and confirmation screen.

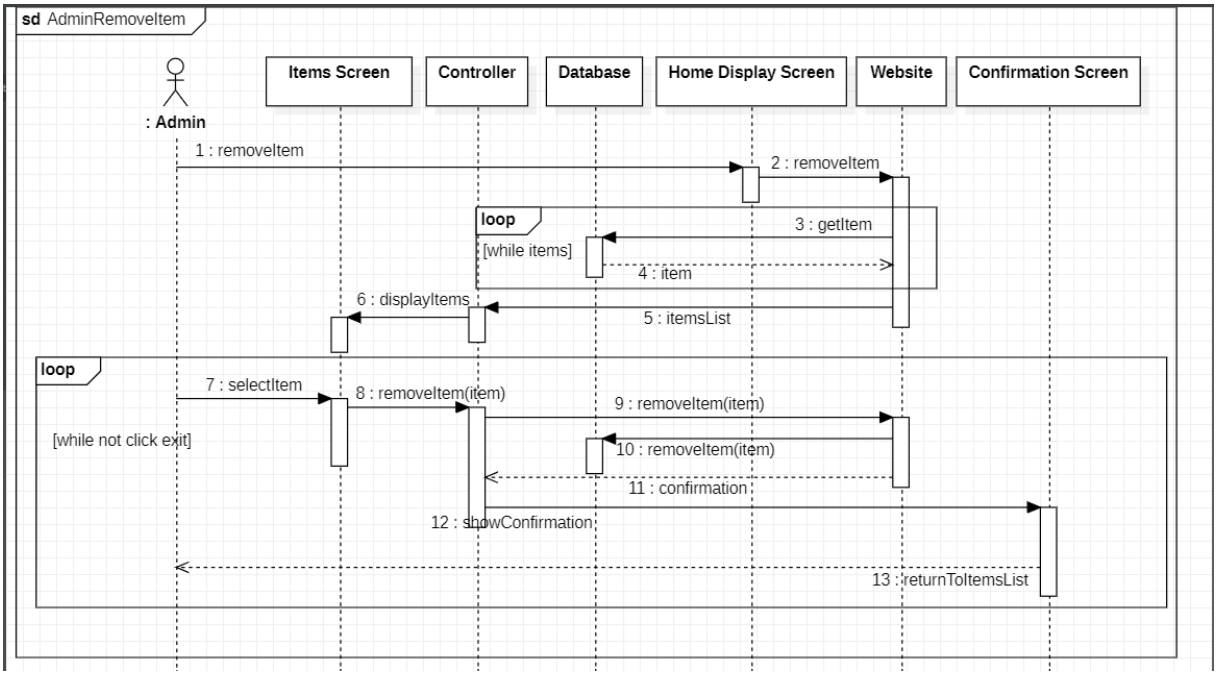


Figure 3.10. RemoveItem Sequence Diagram

Admin update item: The following sequence diagram illustrates the steps followed by the admin when updating the items in the system. In this diagram, there is a loop which helps admin to update multiple items simultaneously. The admin interacts with various objects through the controller. Here, there is one actor, which is the admin and three screens namely, items screen, home display screen and confirmation screen. To complete the update, the admin must fill-in the item detail form.

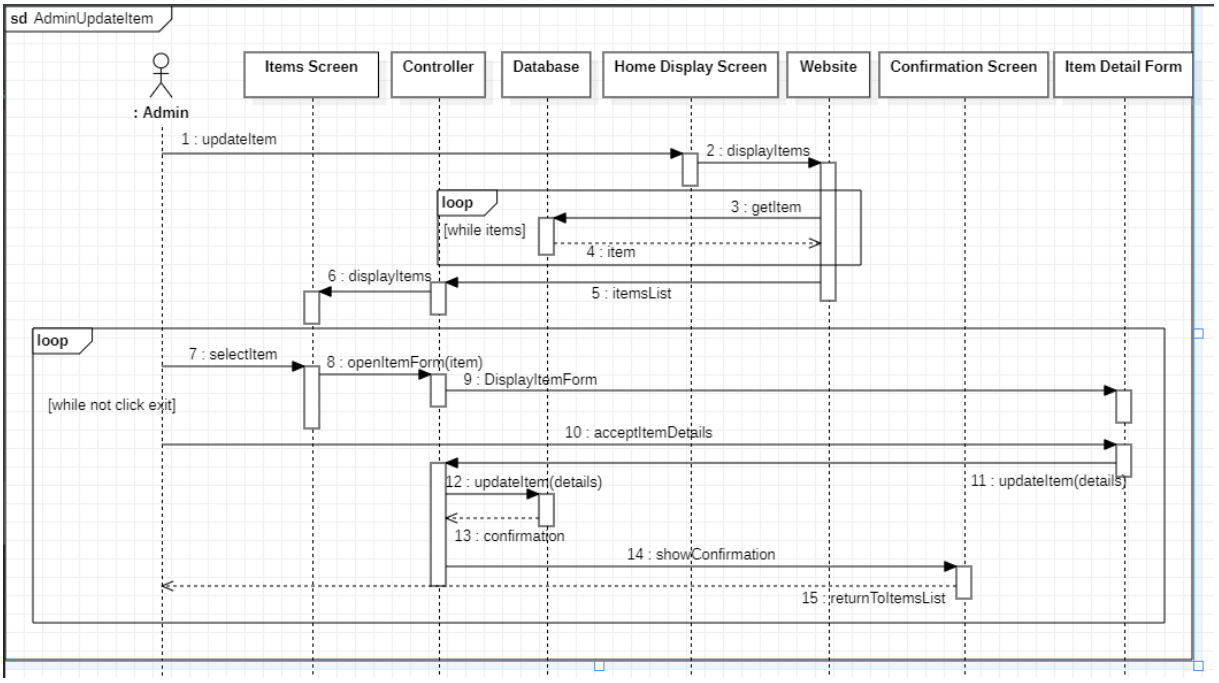


Figure 3.11. UpdateItem Sequence Diagram

3.1.4 Data Flow Diagrams

Context: The following diagram is a context diagram that describes the system in a broader way. In this diagram, there are five external entities namely, customer, admin, user, youtube and the bank. The system is the website which is enclosed as a complete process. As is expected from such a system, most of the dataflow is between the customer and the system as the customer initiates many flows with the system. The admin also interacts with the system in fixing the issues and updating the system inventory. The bank is responsible for facilitating the transaction and youtube helps in the retrieval of related video. User as an entity has a limited role and is involved with the registration in the system.

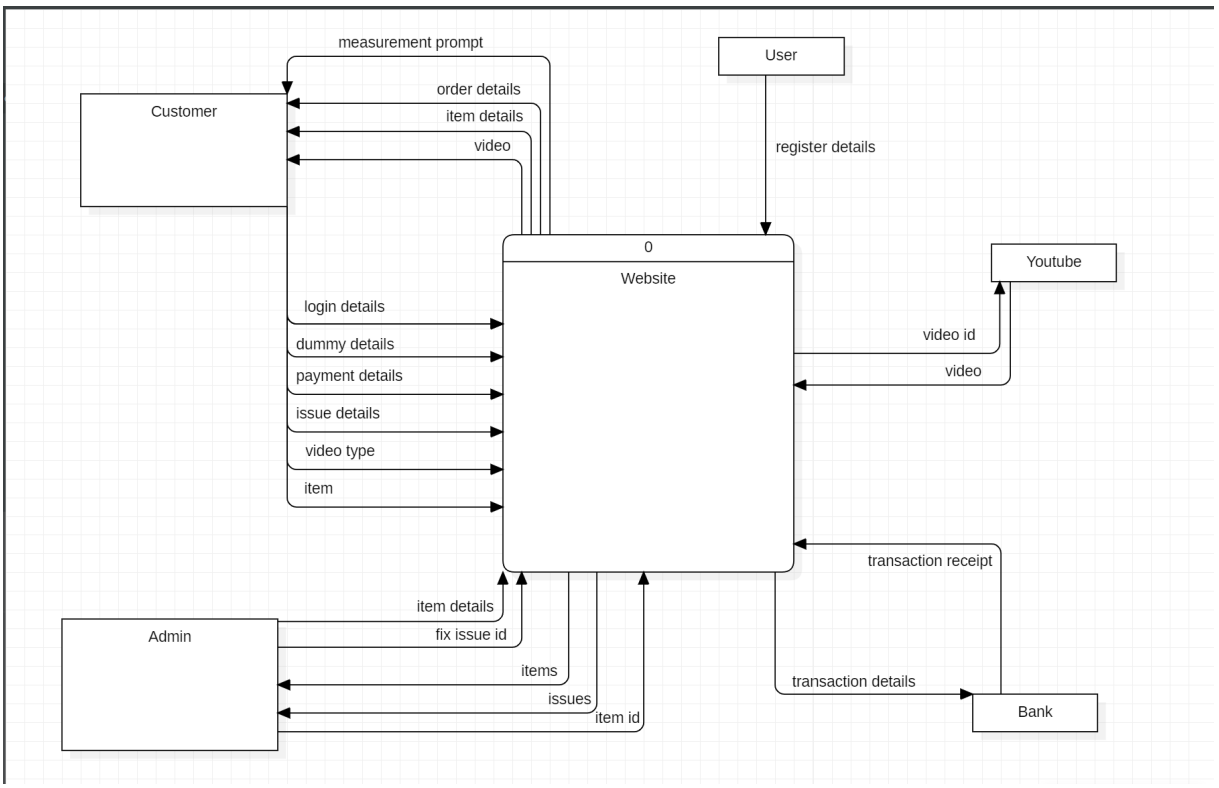


Figure 4.1. Context DFD

Level 0: The following diagram is a level-0 diagram that describes the system including the core processes. In this diagram, the five external entities namely, customer, admin, user, youtube and the bank from the context diagram are included, however, the processes are more described in detail. The system is broken down in 6 subprocesses, namely chatbot, user, admin, basket and order process. In this diagram, a datastore called the database has also been included to show the flow of data in and out of the system.

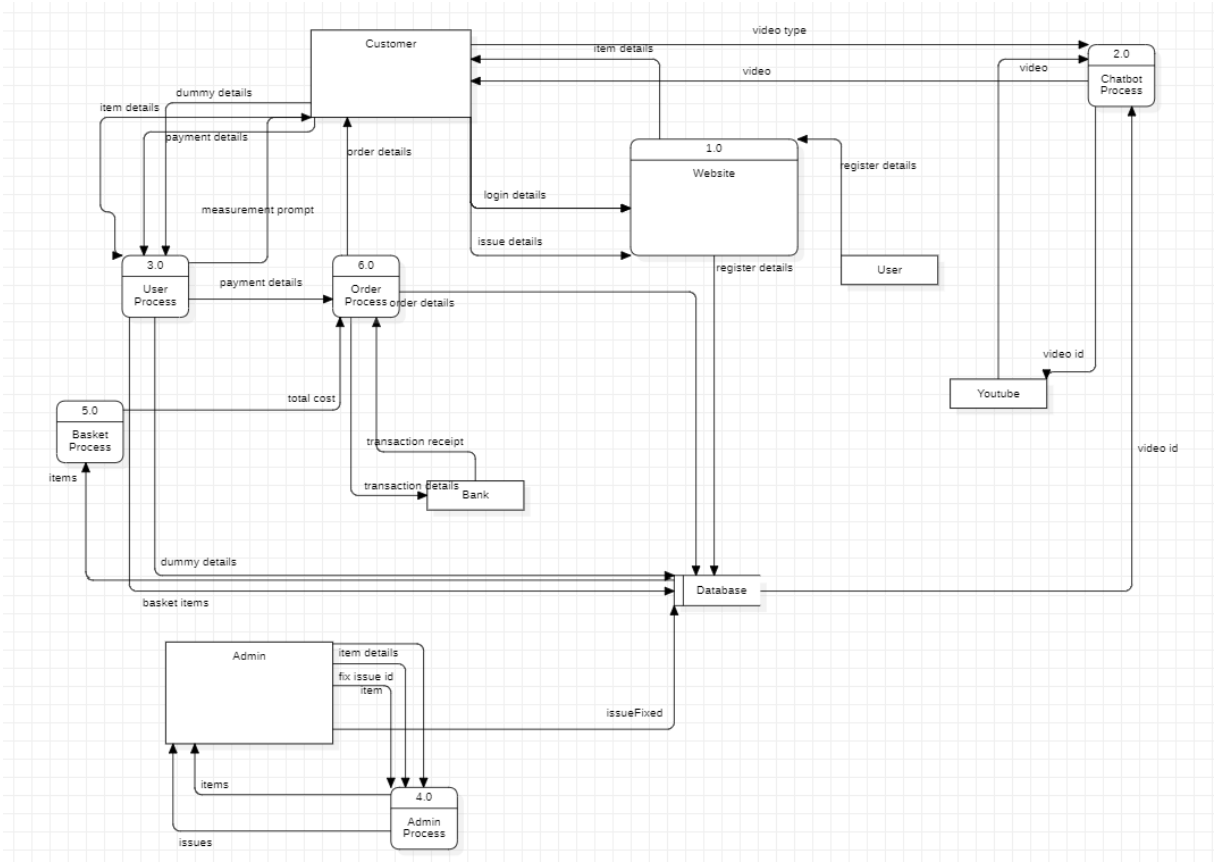
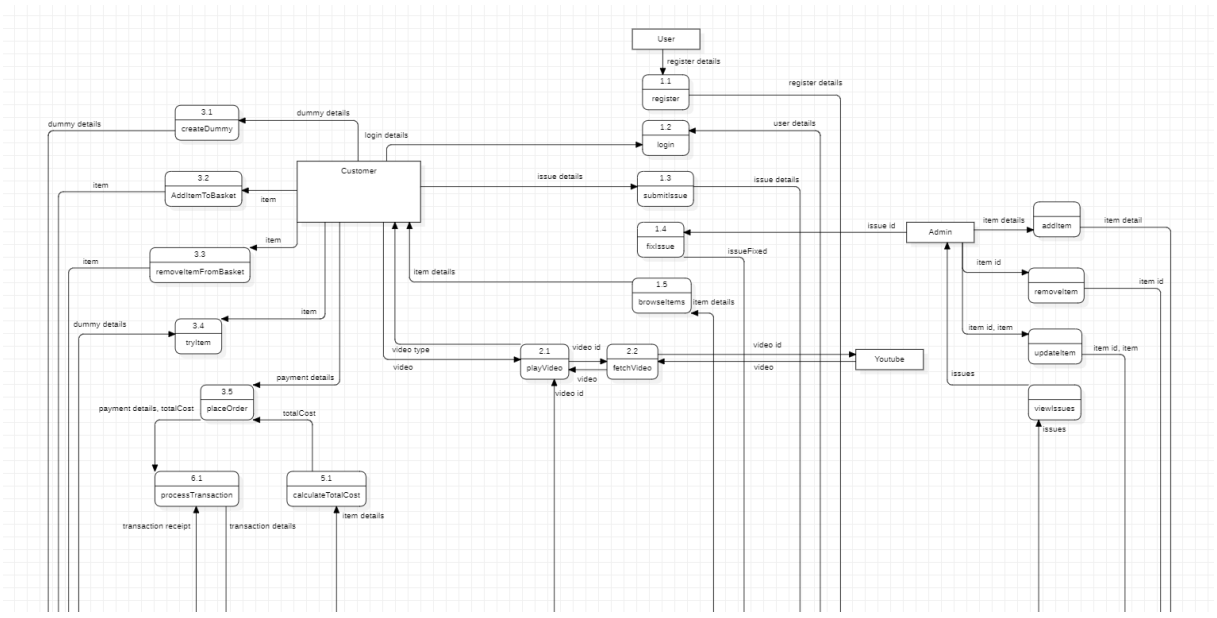


Figure 4.1. Level 0 DFD

Level 1: The following diagram is a level-1 data flow diagram that has further divided the processes into subprocesses. In this diagram, there are five external entities namely, customer, admin, user, youtube and the bank. For instance, the user process described as 3.0 in the previous diagram is further divided into 3.1. CreateDummy, 3.2. AddItemToBasket, 3.3. RemoveItemFromBasket, 3.4. tryItem and 3.5. placeOrder.



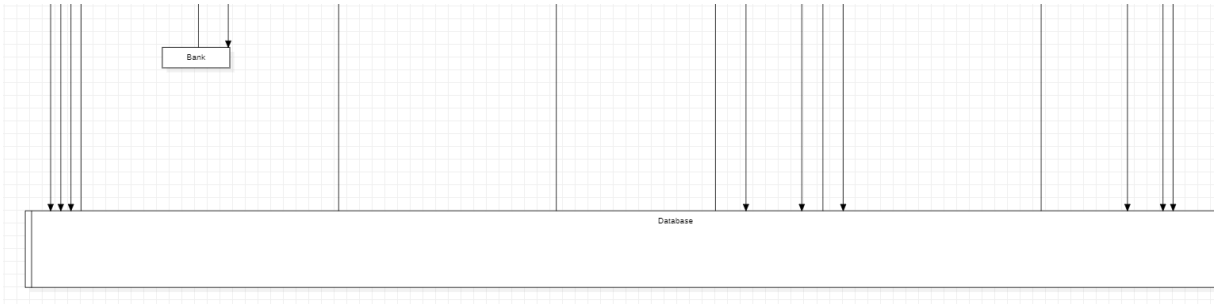


Figure 4.2. Level 1 DFD

Development View

3.1.5 Component Diagram

The following diagram details the component view of the system. It is drawn keeping in mind the class diagram. It illustrates the main components of the system. In total, there are 11 components which are connected via providing or receiving statuses. For instance, YouTube is providing to the chatbot component and Item provides itemList (function) to the website and so on and so forth.

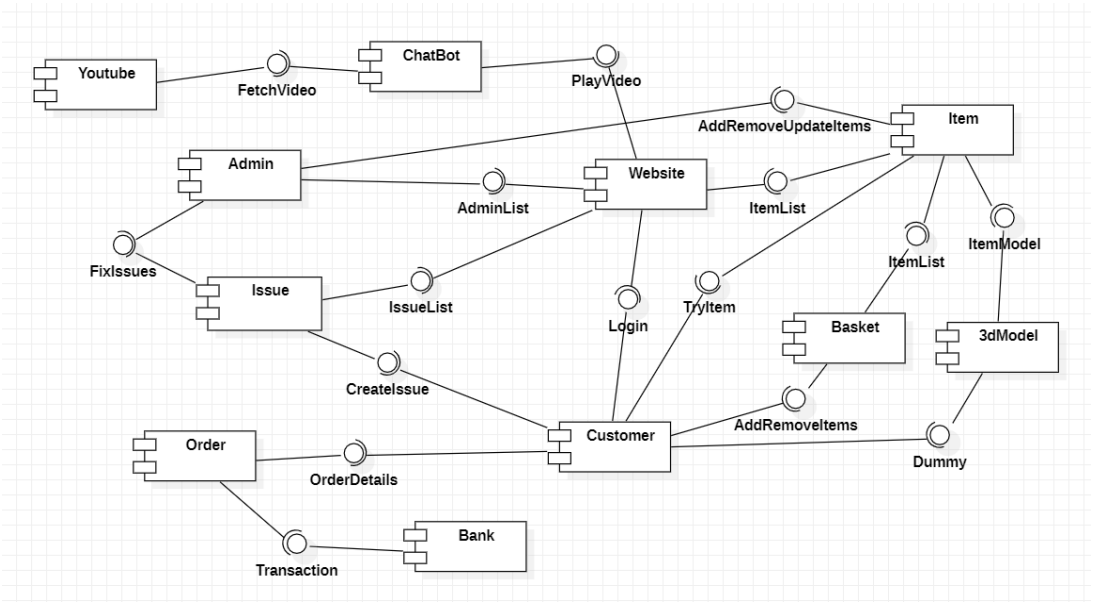


Figure 5.1. Component Diagram

3.1.6 Deployment Diagram

The following diagram illustrates the deployment view of the system. This diagram has been created after extending the above component diagram. In this diagram, there are 4 nodes, namely, youtube, bank, cloud and web server. The nodes also include the respective artifacts, for instance, youTube node has the video database. These nodes are connected via the association relationship as described in the diagram.

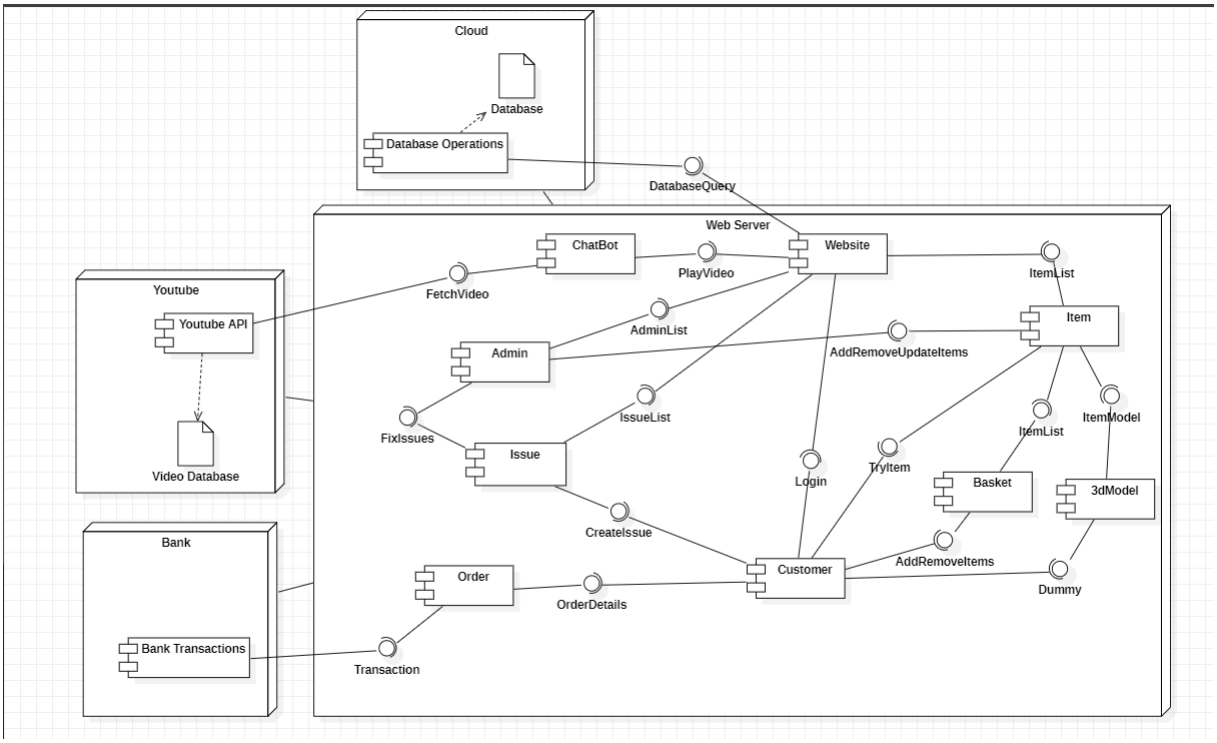


Figure 6.1. DeployementDiagram

4 References

Provide a complete list of all documents referenced elsewhere in the report by using APA style <https://apastyle.apa.org/style-grammar-guidelines/references/examples>.

Grading Item	Mark
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Architectural Views – Physical View - Deployment Diagram - Design Rationale	2
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* Marks will be deducted from other related sections if they are not provided where necessary.