SMART - FASHION-RECOMMENDER- APPLICATION

1. INTRODUCTION

a. **Project Overview**

Smart fashion recommendation systems (FRSs) have attracted a huge amount of attention from fast fashion retailers as they provide a personalized shopping experience to consumers. On e-commerce platforms, where numerous choices are available, an efficient recommendation system is required to sort, order, and efficiently convey relevant product content or information to users.

b. Purpose

A well-defined user profile can differentiate a more personalized or customized recommendation system from a conventional system. Various research projects on apparel recommendation systems with personalized styling guideline and intelligent recommendation engines have been conducted based on similarity recommendation and expert advisor recommendation systems.

2. LITERATURE SURVEY

a. Existing problem

This article reviews various works in Iashion recommenders usin Ö deep learning that are published from 2016 to 2020. Researchers have used deep learning models distinctly or by pairing with other machine learning models in building the recommendation system. The manuscript provides a brief description of the persuading deep learning models that owns a place in recommendation systems.

b. References

 $https://www.researchgate.net/publication/334078160_An_Intelligent_Personalized_Fashion_Recommend \\ ation_System$

c. Problem Statement Definition

The world of retail is changing rapidly. Many brick and mortar locations are closing and being replaced by online stores, direct-to-consumer brands, and subscription/membership services. However, while the breadth of assortment is something that drives customers to a website, a lot of eCommerce platforms fail to sell through a high percentage of their merchandise.

3. IDEATION & PROPOSED SOLUTION

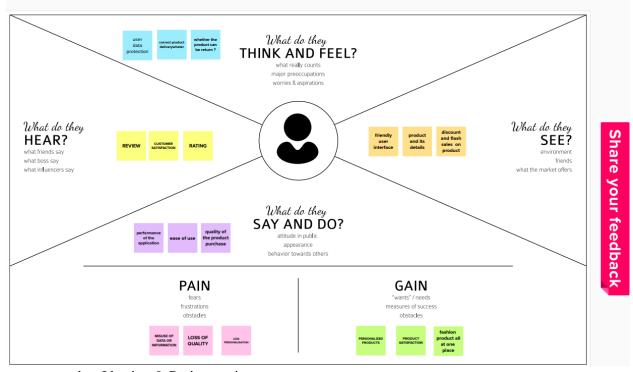
a. Empathy Map Canvas



Gain insight and understanding on solving customer problems.

1

Build empathy and keep your focus on the user by putting yourself in their shoes.



Edit this template

b. Ideation & Brainstorming

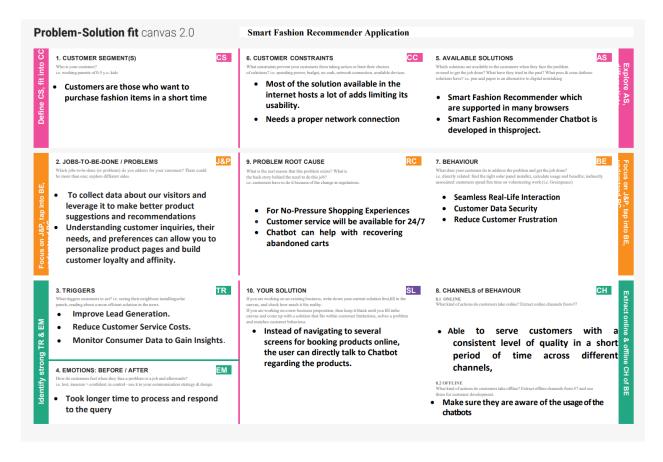


Project Design Phase-I Proposed

Project team shallfill the following information in proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	 Lack of interaction between application and user User need to navigate across multiple pages to chooseright product Confusion in choosing product Lack of sales Complex UserInterface. Lack of proper guidance.
2.	Idea / Solution description	By using Smart fashion recommender application: Improve customer relationship, interactivity and services. Effective recommendation of products. Recommendation within a single page via chat-bot Collect feedback instantly. Reduce humanerror Proper guidance in accessing application.
3.	Novelty / Uniqueness	Chat-bot asks and learns from user preference which recommends appropriate products to the user without makingthem to searchthrough various filters. Reduces time in choosing right product thusincreases sales.
4.	Social Impact/ Customer Satisfaction	 Feedback from the user at the end of session or afterplacing order is one of the most important factorin deriving customer satisfaction and providing better services.
5.	Business Model (Revenue Model)	The application can be developed at minimum cost with high performance and interactive user interface.
6.	Scalability of the Solution	The solution can be madescalable by usingmicro service architecture provided that each server responsible for certain functionality of the application. Storing user preferences along with productin browser cookiewill enable to provide response instantly and allows for fetching related products.

c. Problem Solution fit



4. **REQUIREMENT ANALYSIS**

a. Functional requirement

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirements	Sub Registration
FR-1	Registration	Registration can be done using mobile number or gmail and needed some user information
FR-2	Login	User only log in by user id and password, Which is given during registration
FR-3	Delivery confirmation	Confirmation via emailand phone number
FR-4	Assistance	Bot is integrated with the application to make theusability simple

Non-Functional Requirements:

Following are the Non-Functional requirements of the proposed solution.

FR No.	Non- Functional Requirement	Description				
NFR- 1	Usability	A user-friendly interface with chat bot to makeusability efficient				
NFR- 2	Security	Secured connection HTTPS should be established for transmitting requests and responses				
NFR- 3	Reliability	The system shouldhandle excepted as well as unexpected errors and exceptions to avoid termination of theprogram				
NFR- 4	Performanc e	The system shall be able to handle multiple requests at any given point in time and generate an appropriate response.				
NFR- 5	Availability	It is a cloud based web application so user can access without any platform limitations ,just using a browsers with a internet connection is enough for use the application				
NFR- 6	Scalability	It has a quick request and response time, high throughput, enough network resources and so on.				

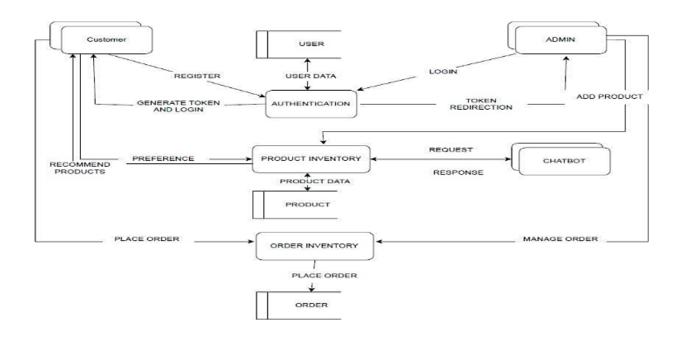
5.PROJECT DESIGN

5.1 Data Flow Diagrams

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

Data Flow Diagram for the proposed solution:



5.2 Solution & Technology Architecture

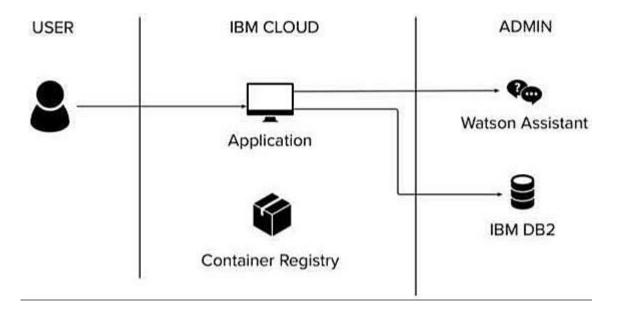
Solution Architecture:

We have developed a new innovative solution through which you can directly do your online shopping based on your choice without any search. It can be done by using the chatbot. In this project you will be working on two modules:

- · Admin
- · User

Instead of searching for products in the search bar and navigating to individual products to find required preferences, this project leverages the use of chatbots to gather all required preferences and recommend products to the user. The solution is implemented in such a way as to improve the interactivity between customers and applications. The chatbot sends messages periodically to notify offers and preferences. For security concerns, this application uses a token to authenticate and authorize users securely. The token has encoded user id and role. Based on the encoded information, access to the resources is restricted to specific users.

Technical Architecture:



The solution is implemented in such a way as to improve the interactivity between customers and applications. The chatbot sends messages periodically to notify offers and preferences. For security concerns, this application uses a token to authenticate and authorize users securely.

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	ApplicationLogic-2	Logic for a process in the application	IBM WatsonSTT service
4.	ApplicationLogic-3	Logic for a process in the application	IBM WatsonAssistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc.
7.	File Storage	File storagerequirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API,etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server/ Cloud)	Application Deployment on Local System / Cloud Local ServerConfiguration: Cloud ServerConfiguration:	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source	Technology of Opensource
		frameworks used	framework
2.	Security Implementations	List all the security / access	e.g. SHA-256,
		controls implemented, use of	Encryptions, IAM
		firewalls etc.	Controls, OWASP
			etc.
3.	Scalable Architecture	Justify the scalability of	Technology used
		architecture (3 –	
		tier,Micro-services)	
4.	Availability	Justify the availability	Technology used
		of application (e.g. use	
		of load balancers,	
		distributed servers etc.)	
5.	Performance	Design consideration forthe	Technology used
		performance of the	
		application (number of	
		requests per sec, use of	
		Cache, use of CDN's)	
		etc.	

5.3User Stories

Use the below template to list all the user stories for the product.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password. I can access my account / H dashboard dashboard		High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application			Sprint-1
		USN-3	As a user, I can register for the application through Facebook			Sprint-2
		USN-4	As a user, I can register for the application through Gmail			Sprint-1
	Login	USN-5	As a user, I can log into the application by entering email & password I can access and make purchases.		High	Sprint-1
	Dashboard					
Customer (Web user)	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	I can access my account / dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application			Sprint-1
		USN-3	As a user, I can register for the application through Facebook			Sprint-2
		USN-4	rough Gmail		Medium	Sprint-1
		USN-5	s a user, I can log into the application by I can access and make ntering email & password purchases.		High	Sprint-1
Administrator	Login	USN-1	I enter my mail and password on organisation's approval	I can approve products and purchases	High	Sprint-1 Administrator

6. PROJECT PLANNING & SCHEDULING

a. Sprint Planning & Estimation

Remaining tasks (Milestones & Activities) to be completed

Milestones	Activitie	Description
	S	
Project Development Phase	Delivery of Sprint – 1,2,3,4	To develop the code and submit the developed code by testingit
Setting up App environment	Create IBM Cloud account	Signup for an IBM Cloud account
	Create flask project	Getting started with Flask to create project
	Install IBM Cloud CLI	Install IBM Command Line Interface
	Docker CLI Installation	Installing DockerCLI on laptop

	Create an account in sendgrid	Create an account in sendgrid. Use the serviceas email integration to our application forsending emails
Implementing web Application	Create UI to interact with Application	Create UI Registration page Login page View products page Add products page
	Create IBM DB2 & connect with python	Create IBM DB2service in IBM Cloud and connect with python codewith DB
Integrating sendgrid service	Sendgrid integration with python	To send emails form the application we need to integrate the Sendgrid service
Developing a chatbot	Building a chatbot and Integrateto application	Build the chatbot and Integrateit to the flask application
Deployment of App in IBM Cloud	Containerize the App	Create a docker image of your application and push it to the IBMcontainer registry
	Upload image to IBM container registry	Upload the image to IBM container registry
	Deploy in kubernetes cluster	Once the imageis uploaded to IBM Container registry deploy the image to IBM Kebernetes cluster

b. Sprint Delivery Schedule

Product Backlog, Sprint Schedule, Estimation

Sprint	Functional Requirement (Epic)	User Story November	User Story/ Task	Story points	Priority	Team Members
Sprint-1	Setting up App Environment	USN-1	As a user, I can register in ICTA Academy and create IBM cloud	2	High	Somasundaram K Sanjay S
Sprint-1		USN-2	As a user,I will create a flask project	1	Low	Ronith N Shibi R
Sprint-1		USN-3	As a user,I will install IBM Cloud CLI	2	Medium	Somasundaram K
Sprint-2	Setting up App Environment	USN-4	As a user, I can install Docker CLI	1	Low	Ronith N Vinoth R

3	High High	Shibi R Sanjay S
3	High	
		Somasundaram K
2	High	Vinoth R
1	Medium	Ronith N
1	Low	Shibi R
2	Medium	Sanjay S
3	High	Vinoth R

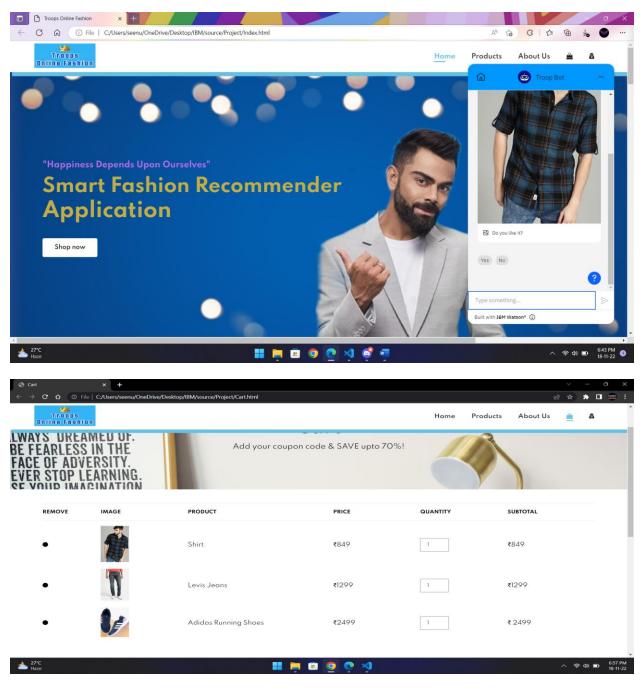
Sprint-4	User panel	As		Register, Login, Email Verification Manual Search	3	High	Somasundaram K Sanjay S Shibi R Ronith R Vinoth R
			3.	Order placement, Order Details			

CODING & SOLUTIONING (Explain the features added in the project along with code)

c. Feature 1

UI to Interact

The user interface is the point at which human users interact with a computer, website or application. The goal of effective UI is to make the user's experience easy and intuitive, requiring minimum effort on the user's part to receive the maximum desired outcome.



d. Feature 2

Chatbot

- Develop skills for recommendation in IBM Watson Assistant and Build a chatbot with IBM Watson Assistant to recommend the fashion based on the taste of the users.
- Using chatbot we can manage user's choices and orders.

- The chatbot can give recommendations to the users based on their interests.
- It can promote the best deals and offers on that day.
- It will store the customer's details and orders in the database.
- The chatbot will send a notification to customers if the order is confirmed.
- Chatbots can also help in collecting customer feedback.

```
vindow.watsonAssistantChatOptions = {
    integrationID: "cdBalc44-da34-4ce7-0464-fi9ld3d04905", // The ID of this integration.
    region: "au-syd", // The region your integration is hosted in.
    serviceInstanceID: "6e0d4621-abc5-4b27-966f-1024e347e4d9", // The ID of your service instance.
    onLoad: function(instance) {
        instance.render();
      }
    };
    setTimeout(function() {
      const t = document.createElement("script");
      t.src = "https://web-chat.global.assistant.watson.appdomain.cloud/versions/" + (window.watsonAssistantChatOptions.clientVersion || "latest") + "/WatsonAssistantChatEntry.js";
      document.head.appendChild(t);
    });
```

TESTING

e. User Acceptance Testing

Purpose of Document

The purpose of this document is to briefly explain the test coverageand open issuesof the [ProductName] project at the time of the release to User Acceptance Testing (UAT).

Defect Analysis

This report shows the number of resolved or closed bugs at each severity level, and how they were resolved.

Resolution	Severity 1	Severity 2	Severity 3	Severity 4	Subtotal
By Design	10	4	2	3	20
Duplicate	1	0	3	0	4
External	2	3	0	1	6
Fixed	11	2	4	20	37
Not Reproduced	0	0	1	0	1
Skipped	0	0	1	1	2
Won't Fix	0	5	2	1	8
Totals	24	14	13	26	77

Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested.

Section	Total Cases	Not Tested	Fail	Pass
Print Engine	7	0	0	7
Client Application	51	0	0	51
Security	2	0	0	2
Outsource Shipping	3	0	0	3
Exception Reporting	9	0	0	9
Final Report Output	4	0	0	4
Version Control	2	0	0	2

RESULTS

f. Performance Metrics

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Model Summary	Chatbot	Same
2.	Accuracy	Training Accuracy – 95% Validation Accuracy – 100%	
3.	Confidence Score	Class Detected - 5 Confidence Score - 10	Superior State of the Commence

ADVANTAGES & DISADVANTAGES

ADVANTAGES	DIS-ADVANTAGES
Fashion makes first impression of a person	May lead to financial trouble
Following fashion trends can be fun	You will have to buy new clothes often
Fashion builds your confident level	Fashion trends are not always comfortable
Puts a smile on your face	Time could be better spent on other hobbies

Makes shopping easier	Fashion trends can be costly
Following fashion trends can make you popular	Your happiness should not depend upon your style

CONCLUSION

All the research through the years led to the birth of these fantastic smart fashion technologies, and they still have a long way to fulfill their true potential. Leading fashion industry companies are beginning to see the many advantages of intelligent fashion and are focusing their attention on this research area; thus, the field is now so vast that a mere customary keyword search might not be enough to access related research articles. This fact highlights the importance of this unified fashion-related task-based survey to draw new researchers' attention to the subject and point them towards correct research directions and sources. This field is becoming enormous, we categorized more articles into multiple task-based groups, and there are still many more. The observed trends and growth speed guarantees that we will soon witness numerous significant improvements that close the human-machine gap.

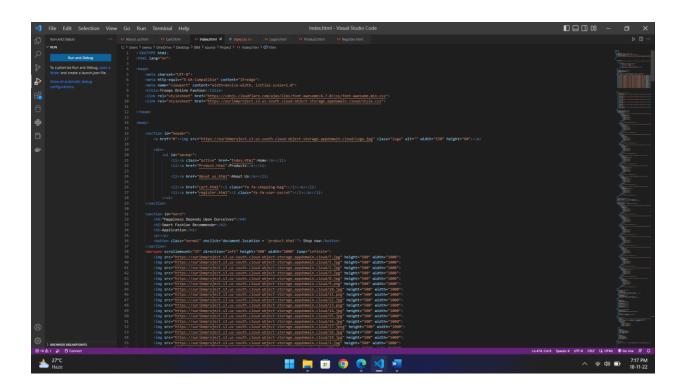
FUTURE SCOPE

The implementation of computer vision and AI in the fashion industry is happening inevitably fast, but not fast enough. Although the past decade has witnessed a dramatic growth of research in this area, the immense size of the area, including various applications and the increased need for online fashion retail shops throughout the world due to Covid-19 pandemic situations, show that still much work needs to be done. A more thorough look at the fashion-related applications in helps us understand which areas need more attention. Needless to say, all of these fashion-related tasks (and many more we did not cover here) are incredibly useful in the fashion industry, and the proper implementation of each and every one of them can be highly profitable for companies. Therefore, it is just a means to track which tasks are already hot topics, today's market needs and fast-growing, and which are neglected, thus have fantastic potential and are very promising in the coming years.

APPENDIX

Source Code

Index.html

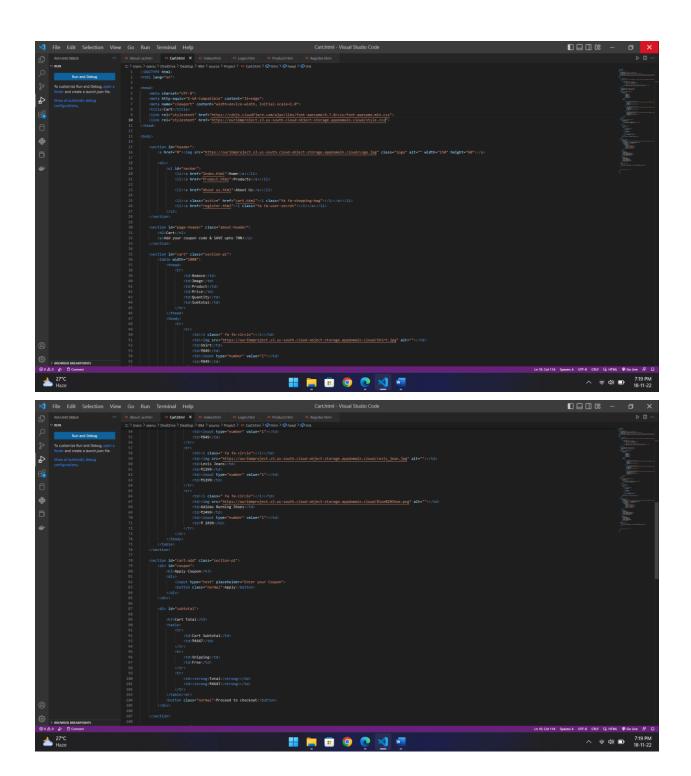


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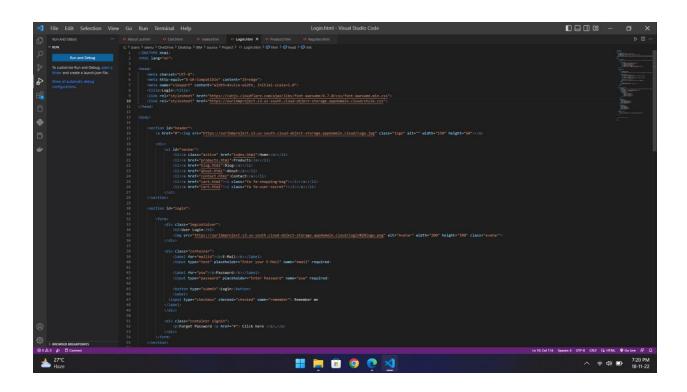
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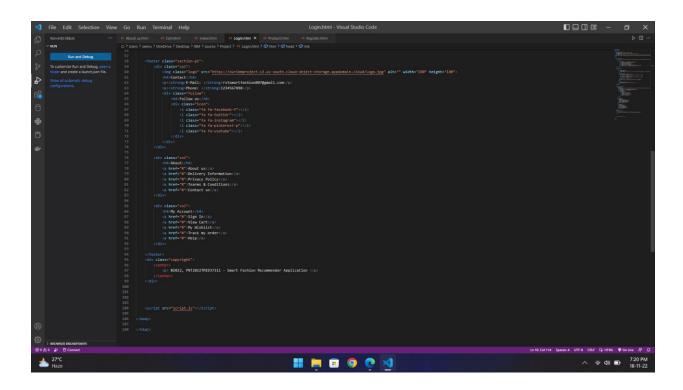
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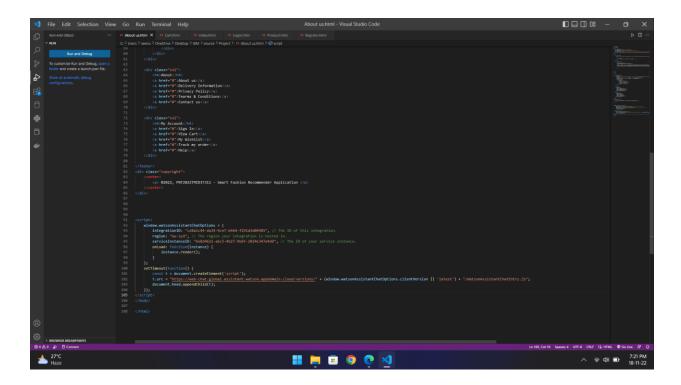




AboutUs.html

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GitHub & Project Demo Link

GitHub Link : <u>IBM-EPBL/IBM-Project-32237-1660208722</u>: <u>Smart Fashion Recommender Application</u> (github.com)

Project Demo Link:

https://drive.google.com/file/d/13N46pAxnitaNHgraiMVM9XZB_M5NNvO4/view?usp=share_link