SMART FASHION RECOMMENDER APPLICATION

USING CLOUD
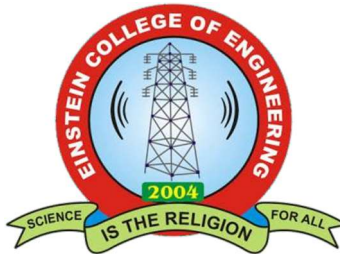
A Project report submitted in partial fulfilment of 7th semester

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by

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BONAFIDE CERTIFICATE

Certified this Report ” **SMART FASHION RECOMMENDER APPLICATION ”**, for the project,is the bonafied work of **Ms S.SRIMATHI (950619104064)**, **Ms T.SUGANYA (950619104065)**, **Ms K.RAMALAKSHMI (950619104055)**, and **Ms A.SIVASAKTHI (950619104062)** who carried out the project work under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was co-offered on the earlier occasion on this or any other candidate.

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CHAPTER 1

1. INTRODUCTION

Humans are inevitably drawn towards something that is visually more attractive. This tendency of humans has led to development of fashion industry over the course of time. With introduction of recommender systems in multiple domains, retail industries are coming forward with investments in latest technology to improve their business. Fashion has been in existence since centuries and will be prevalent in the coming days as well. Women are more correlated with fashion and style, and they have a larger product base to deal with making it difficult to take decisions. It has become an important aspect of life for modern families since a person is more often than not judged based on his attire. Moreover, apparel providers need their customers to explore their entire product line so they can choose what they like the most which is not possible by simply going into a cloth store.

1.1. PROJECT OVERVIEW

The system will be web-based meaning that the users need to run the URL in order to run the system. The system will run both horizontally and vertically. The architecture used in the system is shown horizontally where the Model View Controller is explained. The system comprises of the Client tire, which is the front end or View mode, middle tier which is the system controller and the backend tire which is the model. The client side is where the users/customers log in in the system, browse for the system interface, provide input query image to the system, and get recommendation according to the input query. The middle true is responsible for communication between the front end and the back end. It receives user requests and sends them to the back end and in turn accepts responses from the back end and sends them to the user. The back end which involves the data set and recommender algorithm deals with data storage, user input data storage, processing user requests, determining user input

similarity, making recommendations and forwarding them to the middle tier which in turn sends them to the respective users.

1.2. PURPOSE

The objective of recommender systems is to provide recommendations based on recorded information on the users' preferences. These systems use information filtering techniques to process information and provide the user with potentially more relevant items. Recommendation systems are a very popular and effective paradigm in retail business. With a recommendation system, shoppers can find items they like with less effort. Furthermore, they are presented with items they've never thought of buying, but which actually suits their needs. Apart from a stellar resume, a letter of recommendation is the only document that validates your achievements, personal attributes and skills from someone else. This document is imperative in proving your worthiness and credibility.

CHAPTER 2

2. LITERATURE SURVEY

REVIEW- 1

Title of the paper: Fashion Recommendation Systems

Name of the author: Samit Chakraborty, Md. Saiful Hoque, Naimur Rahman Jeem, Manik Chandra Biswas, Deepayan Bardhan and Edger Lobaton

Problem Description:

In recent years, the textile and fashion industries have witnessed an enormous amount of growth in fast fashion. 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. Image-based fashion recommendation systems (FRSs) have attracted a huge amount of attention from fast fashion retailers as they provide a personalized shopping experience to consumers. Despite its huge potential, the number of academic articles on this topic is limited. The available studies do not provide a rigorous review of fashion recommendation systems and the corresponding filtering techniques.In addition, this review also explores various potential models that could be implemented to develop fashion recommendation systems in the future.

REVIEW 2:

Title of the paper: Smart Fashion: A Review in Virtual Try-On & Fashion Synthesis

Name of the author: Seyed Omid Mohammadi , Ahmad Kalhor

Problem Description:

The rapid progress of computer vision, machine learning, and artificial intelligence combined with the current growing urge for online shopping

systems opened an excellent opportunity for the fashion industry. As a result, many studies worldwide are dedicated to modern fashionrelated applications such as virtual try-on and fashion synthesis. However, the accelerated evolution speed of the field makes it hard to track these many research branches in a structured framework. This paper presents an overview of the matter, categorizing 110 relevant articles into multiple sub-categories and varieties of these tasks. An easy-to-use yet informative tabular format is used for this purpose. Such hierarchical application-based multi-label classification of studies increases the visibility of current research, promotes the field, provides research directions, and facilitates access to related studies.

REVIEW 3:

Title of the paper:A Review on Clothes Matching and Recommendation System Based on User Attributes

Name of the author: Atharv Pandit , Kunal Goel , Manav Jain , Neha Katre

Problem Description:

Dressing appropriately is very important when going out in the real world. Wearing clothes properly that show some level of style and wearing them such that they adhere to the norms of social standard uplifts the confidence of the person and creates very good impression. The study focuses on helping the user to find optimized matching pair of clothes taking into account intricate details like style, patterns , colors, textures, etc. also keeping in mind users attributes like age, skin tone, favourite color etc. It aims to help the user choose clothes that are fashionable and organize their closet. It tries to help the user to wear clothes that are suitable to occasions and helps user to buy clothes that would suit their style. In this paper, an in depth study is performed of various systems that are developed for the various features that must be kept in mind for making a robust system that finds matching clothes of the user as well as makes

recommendations. Systems that are used for clothes detection have been studied and their merits and demerits high-lighted. Systems that are used for clothes detection have also been studied to make the system user- friendly while the user provides input.

REVIEW 4:

Title of the paper: Image-Based Fashion Recommender System

Name of the author: Shaghayegh Shirkhani

Problem Description:

Fashion is perceived as a meaningful way of self-expressing that people use for different purposes. It seems to be an integral part of every person in modern societies, from everyday life to exceptional events and occasions. Fashionable products are highly demanded, and consequently, fashion is perceived as a desirable and profitable industry. Although this massive demand for fashion products provides an excellent opportunity for companies to invest in fashion-related sectors, it also faces different challenges in answering their customer needs. Fashion recommender systems have been introduced to address these needs. This thesis aims to provide deeper insight into the fashion recommender system domain by conducting a comprehensive literature review on more than 100 papers in this field focusing on image-based fashion recommender systems considering computer vision advancements.

REVIEW 5:

Title of the paper: Design and Implementation of Clothing Fashion Style Recommendation System

Name of the author: Muhammad KHALID1 , Mao KEMING1 , Tariq HUSSAIN

Problem Description:

In recent years, the huge amount of information and users of the internet service, it is hard to know quickly and accurately what the user wants. This phenomenon leads to an extremely low utilization of information, also known as the information overload problem. Traditionally, keywords are used to retrieve images, but such methods require a lot of annotations on the image data, which will lead to serious problems such as inconsistent, inaccurate, and incomplete descriptions, and a huge amount of work. To solve this problem, Content Based Information Retrieval (CBIR) has gradually become a research hotspot. CBIR retrieves picture objects based entirely on the content. The content of an image needs to be represented by features that represent its uniqueness. Based on data-driven, this thesis uses convolutional neural network as a visual extractor of image objects. This experimental model shows and achieves better results than the ones of the previous schemes.

2.1. EXISTING PROBLEM

Recommender systems such as Collaborative Filtering or Content-Based Filtering have difficulties in the fashion domain due to the sparsity of purchase data, or the insufficient detail about the visual appearance of the product in category names. Instead, more recent literature has leveraged models that capture a rich representation of fashion items through product images, text descriptions or customer reviews, or videos which are often learned through surrogate tasks like classification or product retrieval. However, learning product representations from such input data requires large datasets to generalize well across different image (or text) styles, attribute variations, etc. Furthermore, constructing a representation that learns which product features customers take most into account when evaluating fashion products is still an open research problem.
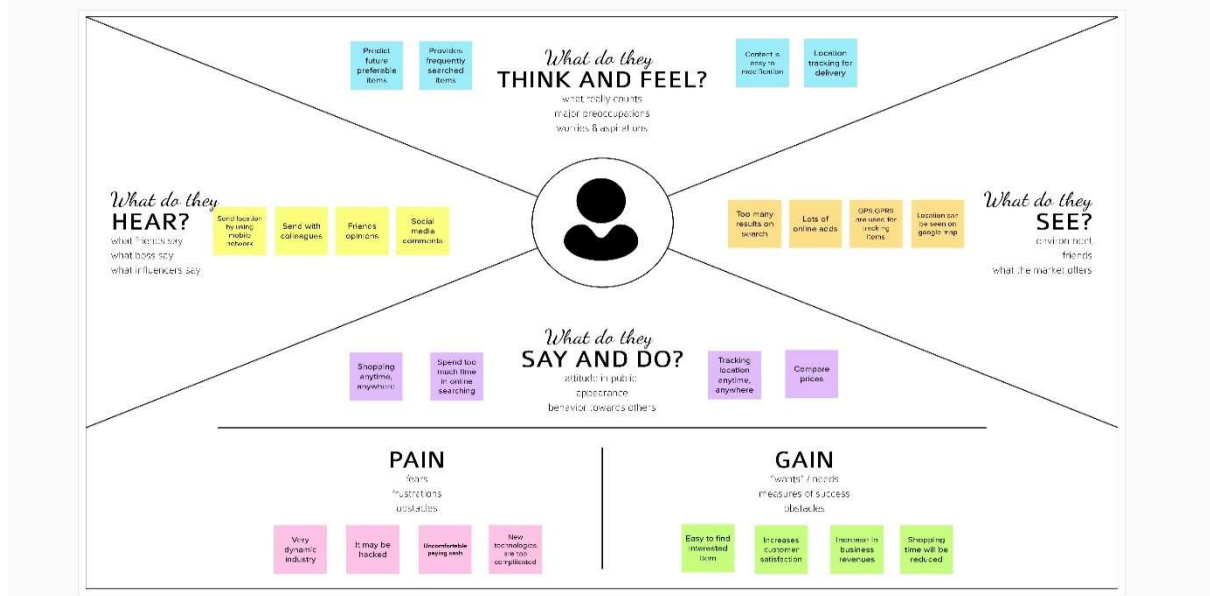
2.2. REFERENCES

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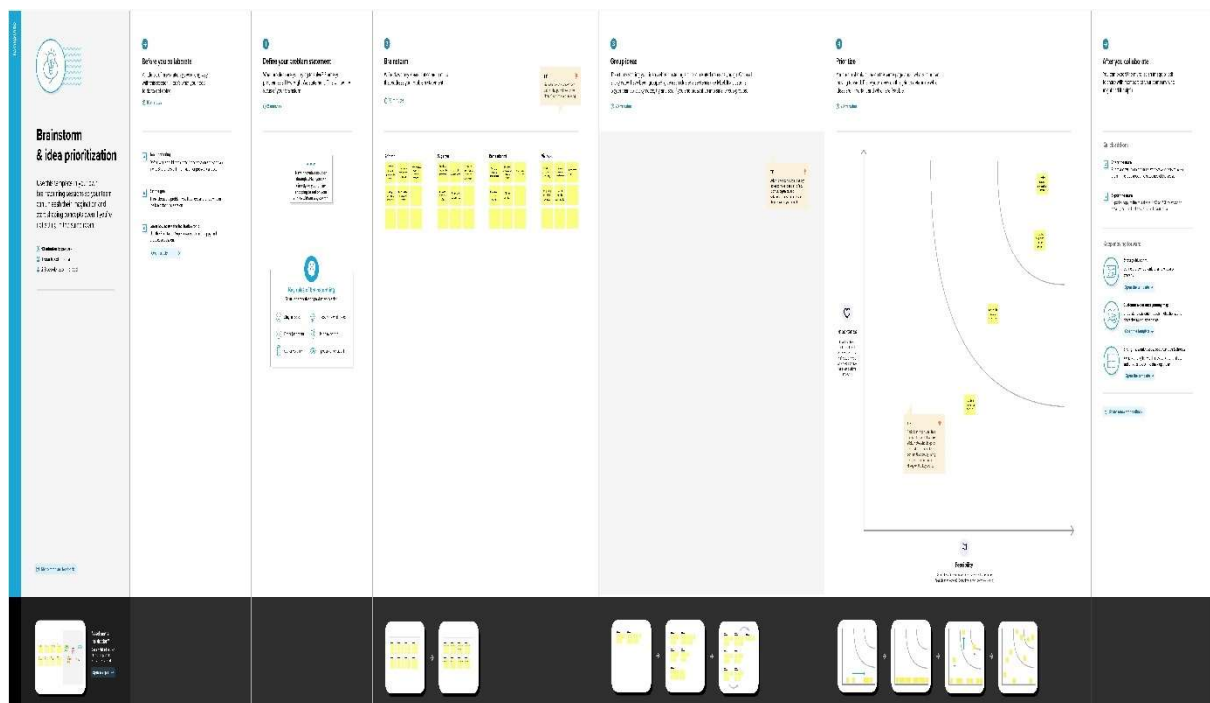
CHAPTER 3

3. IDEATION & PROPOSED SOLUTION

3.1. EMPATHY MAP CANVAS

3.2. IDEATION & BRAINSTORMING

3.3. PROPOSED SOLUTION

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	A recommendation system is a system that is programmed to predict future preferable items from a large set of collections. A recommendation system works either by using user preferences or by using the items most preferred by all users
2.	Idea / Solution description	The main challenge in building a fashion recommendation system is that it is a very dynamic industry. It changes very often when it comes to seasons, festivals, pandemic conditions like coronavirus and many more.
3.	Novelty / Uniqueness	Implementation of expert rules to propose an intelligent fashion recommendation system of expert information collection based on eye gaze tracking and the application of interactive evolutionary algorithms to predict users' style preferences.
4.	Social Impact / Customer Satisfaction	Peer recommendations functioning through social shopping sites can increase the accuracy of predictions based on the sharing of lifestyles or experiences with friends, family members and colleagues, who understand the users.

5.	Business Model (Revenue Model)	The proposed system has been validated in a customized design and mass market selection through the evaluations of target consumers and fashion experts using a method frequently used in marketing study.
6.	Scalability of the Solution	This research will be highly beneficial for researchers interested in using augmented and virtual reality features to develop recommendation systems.

3.4. PROBLEM SOLUTION FIT

1.CUSTOMER SEGMENT(S)	6.CUSTOMER CONSTRAINTS	5.AVAILABLE SOLUTIONS
Customer segmentation is the process of dividing customers into groups based on common characteristics so companies can market to each group effectively and appropriately.	As smart clothing market is two- sided one, there are two groups of barriers to adoption of smart garments. On one hand, companies launch products that give personal data to the wearer, on the other hand, gather and analyze big data that perform commercial value.	A growing number of technology companies and fashion brands are operating in the smart clothing market. Moreover, the number of brands expected to join them is on the rise, now that the smart clothes concept become popular.

2.JOBS-TO-BE DONE / PROBLEMS	9.PROBLEM ROOT CAUSE	7.BEHAVIOUR
The unit of analysis is no longer the customer or the product, it's the functional "job" the customer is trying to get done. Customers aren't buyers, they are job executors.	A product testing Netherlands routinely supports manufacturing organizations by addressing complex and urgent identification issues related to particulate matter, foreign matter, unknown particles, and impurities detected in a controlled manufacturing process.	Clothing behavior encompasses the entire spectrum related to clothing, that is clothing choice criteria's, clothing interests, selection of clothes, views about clothing, clues collected and imparted from clothing worn, practices follow during purchase decision, appearance management.

3.TRIGGERS	10.YOUR SOLLUTIONS	8.CHANNELS BEHAVIOUR 8.1 ONLINE
A Trigger is an event that causes a buyer to have a clear need, which usually converts into a sense of purpose and urgency in	This company trade reports majorly contain, Market analysis, price analysis, port analysis and trading partners. By	One of the attack weapons in the marketing

their buying process.	subscribing to the report you can check, product type, Hs codes, Indian ports, price and trading partners and countries.	process in the same way as advertising, merchandising and product design.
4.EMOTIONS A Polish designer has launched a clothing collection that change colour depending on your body temperature, stress levels, movements, and even emotions.		**8.2 OFFLINE** Offline consumer buying behavior refers to the buying behavior of the ultimate consumer who prefers to visit traditional stores or contact salesman, use magazines, newspapers/telephonic media for buying any product/service.

CHAPTER 4

4. REQUIREMENT ANALYSIS

4.1. FUNCTIONAL REQUIREMENTS

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Searching	Searching product in search box

4.2. NON-FUNCTIONAL REQUIREMENTS

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Usability refers to the quality of a user's experience when interacting with applications. Usability is about effectiveness, efficiency and the overall satisfaction of the user.
NFR-2	**Security**	Security is the process of developing, adding and testing security features within applications to prevent security vulnerabilities against

		threats.
NFR-3	**Reliability**	Reliability is the probability of a piece of software operating without failure while in a specific environment over a set duration of time.
NFR-4	**Performance**	Performance indicates how the app is functioning and how responsive the app is to the end-user.
NFR-5	**Availability**	Availability is a measure used to evaluate whether an application is functioning properly and usable to meet the requirements of an individual or business.
NFR-6	**Scalability**	Scalability refers to the capacity of an app to handle growth, especially in handling more users and evolving concurrently with your business needs.

CHAPTER 5

5. PROJECT DESIGN

5.1. 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.

Zero Level DFD - Online Fashion Store

First Level DFD - Online Fashion Store

Second Level DFD - Online Fashion Store
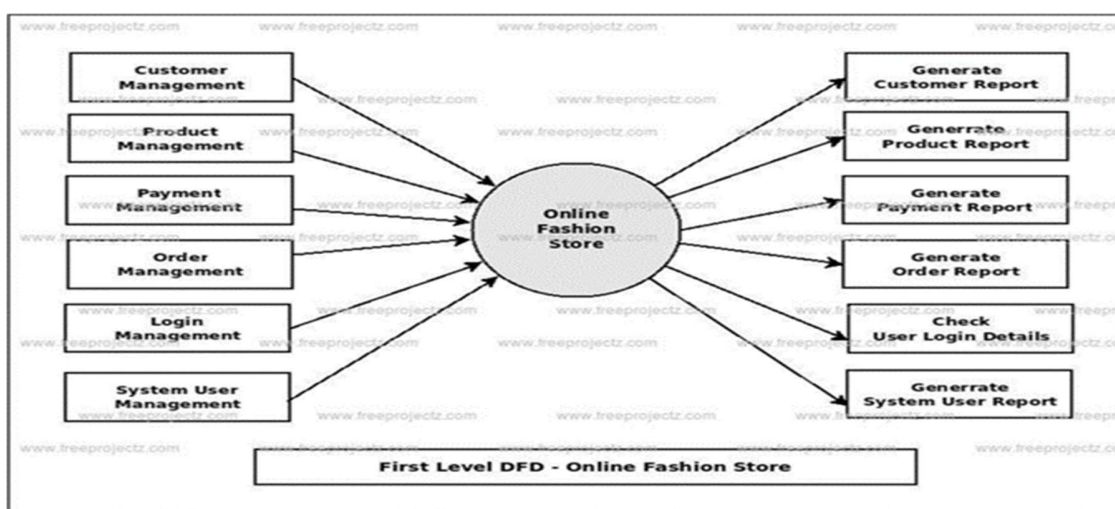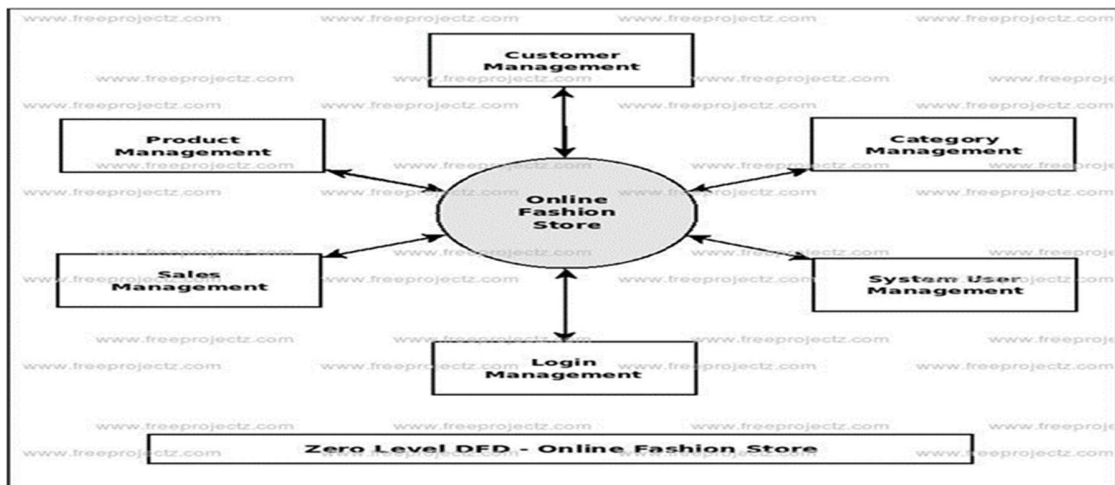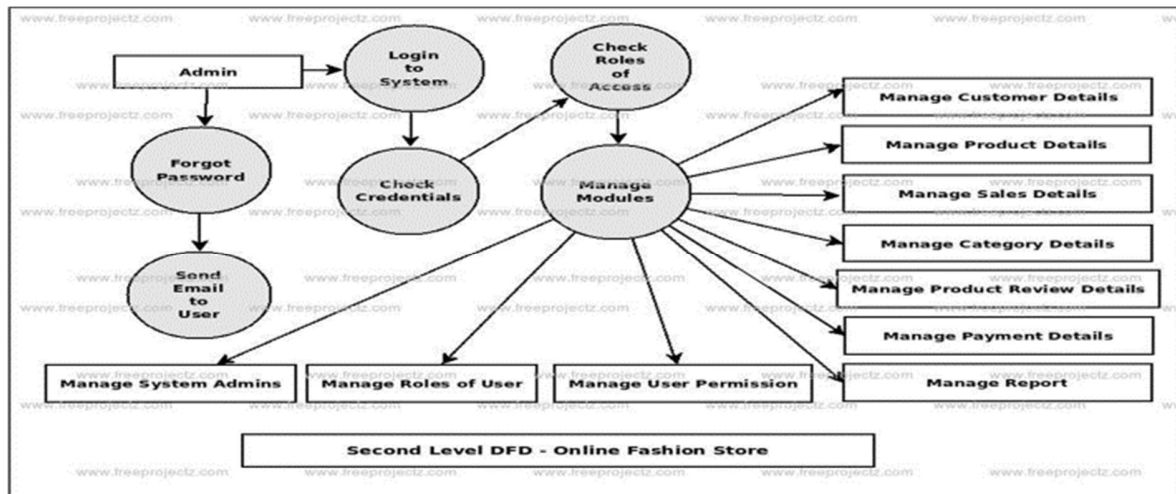
5.2. SOLUTION & TECHNICAL ARCHITECTURE
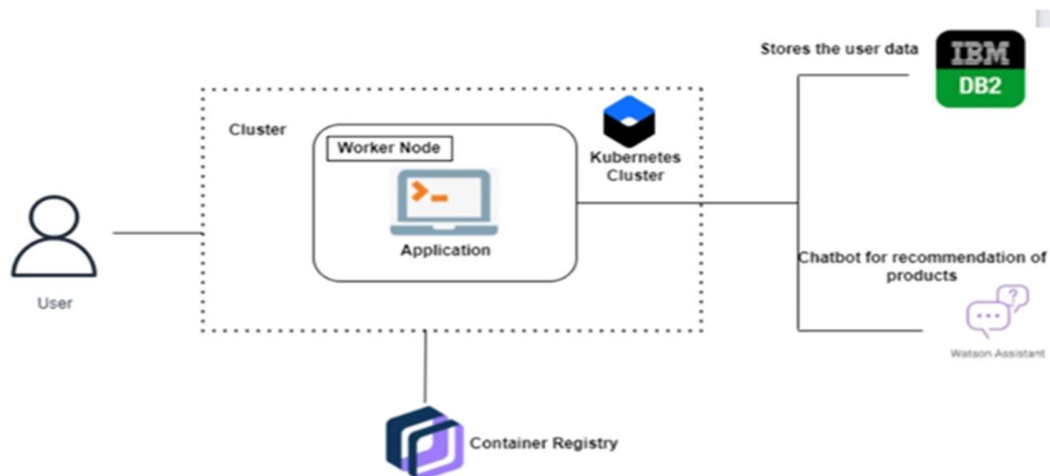
5.3. USER STORIES

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 /dashboard	High	Sprint-1
		USN-2	As a user, I will receive confirmation email once I have registered for the application	I can receive confirmation email & click confirm	High	Sprint-1
		USN-3	As a user, I can register for the application through Gmail	I can receive confirmation gmail	Medium	Sprint-1
	Login	USN-4	As a user, I can	It make my	High	Sprint-1

			log into the application by entering email & password	account more secure		
	Dashboard	USN-5	User can search any product what they want to purchase	It is easy for finding needed products	Medium	Sprint-1
Customer (Web user)	Search		The application shows similar products that are related to searched products	I can see related products	Medium	Sprint-1

CHAPTER 6

6. PROJECT PLANNING & SCHEDULING

Product Backlog, Sprint Schedule, and Estimation:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	User Panel	USN-1	The user will login into the website and go through the products available on the website	10	High	S.Srimathi T.Suganya K.Ramalakshmi A.Sivasakthi
Sprint-2	Admin panel	USN-2	The role of the admin is to check out the database about the stock and have a track of all the things that the users are purchasing.	10	High	S.Srimathi T.Suganya K.Ramalakshmi A.Sivasakthi
Sprint-3	Chat Bot	USN-3	The user can directly talk to Chatbot regarding the products. Get the	10	High	S.Srimathi T.Suganya K.Ramalakshmi A.Sivasakthi

			recommendations based on information provided by the user.			
Sprint-4	final delivery	USN-4	Container of applications using docker kubernetes and deployment the application. Create the documentation and final submit the application	10	High	S.Srimathi T.Suganya K.Ramalakshmi A.Sivasakthi

CHAPTER 7

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

7.1 Feature 1 Software Requirement Specification (SRS)

The software, Site Explorer is designed for management of web sites from a remote location. The main purpose for preparing this document is to give a general insight into the analysis and requirements of the existing system or situation and for determining the operating characteristics of the system.

Scope: This Document plays a vital role in the development life cycle (SDLC) and it describes the complete requirement of the system. It is meant for use by the developers and will be the basic during testing phase. Any changes made to the requirements in the future will have to go through formal change approval process.

DEVELOPERS   RESPONSIBILITIES   OVERVIEW:

The developer is responsible for:

- Developing the system, which meets the SRS and solving all the requirements of the system?
- Demonstrating the system and installing the system at client's location after the acceptance testing is successful.
- Submitting the required user manual describing the system interfaces to work on it and also the documents of the system.
- Conducting any user training that might be needed for using the system.
- Maintaining the system for a period of one year after installation.

- To provide a consistent object-oriented programming environment whether object code is stored and executed locally, executed locally but Internet-distributed, or executed remotely.

- To provide a code-execution environment that minimizes software deployment and versioning conflicts.

- To provide a code-execution environment that guarantees safe execution of code, including code created by an unknown or semi-trusted third party.

- To provide a code-execution environment that eliminates the performance problems of scripted or interpreted environments.

- To make the developer experience consistent across widely varying types of applications, such as Windows-based applications and Web-based applications.

- To build all communication on industry standards to ensure that code based on the .NET Framework can integrate with any other code.

The .NET Framework has two main components: the common language runtime and the .NET Framework class library. The common language runtime is the foundation of the .NET Framework. You can think of the runtime as an agent that manages code at execution time, providing core services such as memory management, thread management, and Remoting, while also enforcing strict type safety and other forms of code accuracy that ensure security and robustness. In fact, the concept of code management is a fundamental principle of the runtime. Code that targets the runtime is known as managed code, while code that does not target the runtime is known as unmanaged code.

User Login Form

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/meyer-reset/2.0/reset.min.css">
  <title>Register | Flask</title>
  <!-- Latest compiled and minified CSS -->
                                    <link                      rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css"
integrity="sha384-
BVYiiSIFeK1dGmJRAkycuHAHRg32OmUcww7on3RYdg4Va+PmSTsz/K68vbd
Ejh4u" crossorigin="anonymous">


  <!-- Optional theme -->
                                        <link                    rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap-
theme.min.css"                                              integrity="sha384-
rHyoN1iRsVXV4nD0JutlnGaslCJuC7uwjduW9SVrLvRYooPp2bWYgmgJQIXwl
/Sp" crossorigin="anonymous">
</head>
<body>
  <div class="container">
    <div class="row" style="margin-top: 40px">
```

```html
        <div class="col-sm-6">
          <form method="POST">
            <div class="form-group">
              <label for="email">Username : </label>
                        <input type="text" name="uname" class="form-control" id="uname">
            </div>
            <div class="form-group">
              <label for="email">Email : </label>
              <input type="email" name="mail" class="form-control" id="mail">
            </div>
            <div class="form-group">
              <label for="email">Password : </label>
                        <input type="password" name="passw" class="form-control" id="passw">
            </div>
                        <button type="submit" class="btn form-control btn-default">Register</button>
          </form>
        </div>
      </div>
    </div>


<!-- Latest compiled and minified JavaScript -->
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js" integrity="sha384-
```

```
Tc5IQib027qvyjSMfHjOMaLkfuWVxZxUPnCJA7l2mCWNIpG9mGCD8wGNIc
PD7Txa" crossorigin="anonymous"></script>
</body>
</html>
```

USER REGISTER FORM

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta http-equiv="X-UA-Compatible" content="ie=edge">
    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/meyer-
reset/2.0/reset.min.css">
    <title>Register | Flask</title>
    <!-- Latest compiled and minified CSS -->
                                                <link                rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css"
integrity="sha384-
BVYiiSIFeK1dGmJRAkycuHAHRg32OmUcww7on3RYdg4Va+PmSTsz/K68vbd
Ejh4u" crossorigin="anonymous">

    <!-- Optional theme -->
                                                <link                rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap-
```

```html
theme.min.css"                                            integrity="sha384-
rHyoN1iRsVXV4nD0JutlnGaslCJuC7uwjduW9SVrLvRYooPp2bWYgmgJQIXwl
/Sp" crossorigin="anonymous">
</head>
<body>
  <div class="container">
    <div class="row" style="margin-top: 40px">
      <div class="col-sm-6">
        <form method="POST">
          <div class="form-group">
            <label for="email">Username : </label>
              <input type="text" name="uname" class="form-control"
id="uname">
          </div>
          <div class="form-group">
            <label for="email">Email : </label>
            <input type="email" name="mail" class="form-control" id="mail">
          </div>
          <div class="form-group">
            <label for="email">Password : </label>
              <input type="password" name="passw" class="form-control"
id="passw">
          </div>
                      <button type="submit" class="btn form-control btn-
default">Register</button>
        </form>
      </div>
```

```
    </div>
  </div>


<!-- Latest compiled and minified JavaScript -->
<script   src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"
integrity="sha384-
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PD7Txa" crossorigin="anonymous"></script>
</body>
</html>
```

7.2 Feature 2

The common language runtime manages memory, thread execution, code execution, code safety verification, compilation, and other system services. These features are intrinsic to the managed code that runs on the common language runtime.

With regards to security, managed components are awarded varying degrees of trust, depending on a number of factors that include their origin (such as the Internet, enterprise network, or local computer). This means that a managed component might or might not be able to perform file-access operations, registry-access operations, or other sensitive functions, even if it is being used in the same active application.

The runtime enforces code access security. For example, users can trust that an executable embedded in a Web page can play an animation on screen or sing a song, but cannot access their personal data, file system, or network. The security

features of the runtime thus enable legitimate Internet-deployed software to be exceptionally featuring rich.

The runtime also enforces code robustness by implementing a strict type- and code-verification infrastructure called the common type system (CTS). The CTS ensures that all managed code is self-describing. The various Microsoft and third-party language compilers

Generate managed code that conforms to the CTS. This means that managed code can consume other managed types and instances, while strictly enforcing type fidelity and type safety.

In addition, the managed environment of the runtime eliminates many common software issues. For example, the runtime automatically handles object layout and manages references to objects, releasing them when they are no longer being used. This automatic memory management resolves the two most common application errors, memory leaks and invalid memory references.

The runtime also accelerates developer productivity. For example, programmers can write applications in their development language of choice, yet take full advantage of the runtime, the class library, and components written in other languages by other developers. Any compiler vendor who chooses to target the runtime can do so. Language compilers that target the .NET Framework make the features of the .NET Framework available to existing code written in that language, greatly easing the migration process for existing applications.

CHAPTER 8

8. TESTING

8.1 Test Cases

Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding. In fact, testing is the one step in the software engineering process that could be viewed as destructive rather than constructive.

A strategy for software testing integrates software test case design methods into a well-planned series of steps that result in the successful construction of software. Testing is the set of activities that can be planned in advance and conducted systematically. The underlying motivation of program testing is to affirm software quality with methods that can economically and effectively apply to both strategic to both large and small-scale systems.

8.2. USER TESTING APPROACHES

The software engineering process can be viewed as a spiral. Initially system engineering defines the role of software and leads to software requirement analysis where the information domain, functions, behavior, performance, constraints and validation criteria for software are established. Moving inward along the spiral, we come to design and finally to coding. To develop computer software we spiral in along streamlines that decrease the level of abstraction on each turn. Unit testing focuses verification effort on the smallest unit of software design, the module. The unit testing we have is white box oriented and some modules the steps are conducted in parallel.

1. WHITE BOX TESTING

This type of testing ensures that

- All independent paths have been exercised at least once
- All logical decisions have been exercised on their true and false sides
- All loops are executed at their boundaries and within their operational bounds
- All internal data structures have been exercised to assure their validity.

To follow the concept of white box testing we have tested each form .we have created independently to verify that Data flow is correct, All conditions are exercised to check their validity, All loops are executed on their boundaries.

2. CONDITIONAL TESTING

In this part of the testing each of the conditions were tested to both true and false aspects. And all the resulting paths were tested. So that each path that may be generate on particular condition is traced to uncover any possible errors.

3. DATA FLOW TESTING

This type of testing selects the path of the program according to the location of definition and use of variables. This kind of testing was used only when some local variable were declared. The *definition-use chain* method was used in this type of testing. These were particularly useful in nested statements.

4. LOOP TESTING

In this type of testing all the loops are tested to all the limits possible. The following exercise was adopted for all loops:

- All the loops were tested at their limits, just above them and just below them.

Each unit has been separately tested by the development team itself and all the input have been validated.

CHAPTER 9

9. RESULTS

9.1 Performance Metrics

In the world that we live today, problems like unemployment and employee churn have shown tremendous increase due to the recent and ongoing pandemic situation where companies either lay-off some of their workers or people leave their jobs to be with their families. In such cases, many people are seen surfing online for finding relevant jobs based on their skills with the internet being an essential employment resource for many of today's job seekers. This is where a Job Recommendation System plays an important role.

The performance of a recommendation algorithm is evaluated by using some specific metrics that indicate the accuracy of the system. The type of metric used depends on the type of filtering technique. Root Mean Square Error (RMSE), Receiver Operating Characteristics (ROC), Area Under Cover (AUC), Precision, Recall and F1 score is generally used to evaluate the performance or accuracy of the recommendation algorithms.

CHAPTER 10

10. ADVANTAGES & DISADVANTAGES

ADVANTAGES

There are numerous uses for a recommendation engine on an ecommerce site. It can create product recommendations, create personalized emails and merchandise products on your site. This software-as-a-service platform has lots of advantages for an ecommerce business.

1. Provide Relevant Material

By analyzing the customer's present site use and his previous browsing history, a recommendation engine can deliver appropriate product suggestions as he stores. The data is gathered in real-time so the software can respond as his shopping habits change.

2.Engage Customer

Customers end up being more engaged in the website when individualized item recommendations are made. They are able to dive even more deeply into the product line without needing to carry out search after search.

3. Transform Shoppers to Clients

Converting buyers into consumers takes an unique touch. Individualized communications from a recommendation engine reveal your customer that he is valued as an individual. In turn, this engenders his loyalty.

4.Increase Average Order Value

Average order values generally go up when a recommendation engine in

uses to show tailored alternatives. Advanced metrics and reporting can definitively reveal the efficiency of a project.

DISADVANTAGES

Personalized recommendations have never been more important for businesses looking to attract and retain customers. According to Accenture, nine out of 10 consumers are more likely to shop with brands that provide relevant offers and recommendations.

1. Significant Investments Required

Recommendation engines are a big investment, not only financially, but in terms of time, too: it takes a long time and deep expertise to build an effective recommendation engine in-house. Besides the requisite data scientists and other assorted specialist staff, you will need to factor in costs for the discovery and analysis phase (including a feasibility study to make sure this is the right path for your business), the prototype implementation phase, the minimum viable product (MVP) development, followed by the final release and deployment.

2. Too Many Choice

Alternatively, you could employ an off-the-shelf solution from a third-party company, but with so many options available on the market, how do you know which is the right one for your business? Evaluating different solutions can be enormously time consuming, as you need to evaluate their case studies, the technology, how the solution will be integrated into your current company setup, and so on.

3.The Complex Onboarding Process

However, this can also be due to a number of other reasons, such as lack of understanding of recommendation models, poor UX design of your website, and insufficient knowledge of your business domain. Employing and assigning the right staff who not only understand the technology but also know the intricate workings of your business will allow you to unlock the full potential of recommendation engines.

4.Lack of Data Analytics Capability

Like all technologies. Recommendation engines rely on data if you do not have high-quality data, or cannot crunch and analyze it properly, you will not be able to make the most of the recommendation engine. To ensure the best quality data, you should ask yourself four questions: How recent is it? How noisy is it? How diverse is it? Recommendation engines can demand high computational complexity. If the data that is fed to the model is less accurate or valuable, the result will be less useful. So, before investing in recommendation engines, make sure your business is up to the complex data analytics demands required.

CHAPTER 11

11. CONCLUSION

Recommender systems are a powerful new technology for extracting additional value for a business from its user databases. These systems help users find items they want to buy from a business. Recommender systems benefit users by enabling them to find items they like. Conversely, they help the business by generating more sales. Recommender systems are rapidly becoming a crucial tool in E-commerce on the Web. Recommender systems are being stressed by the huge volume of user data in existing corporate databases, and will be stressed even more by the increasing volume of user data available on the Web. New technologies are needed that can dramatically improve the scalability of recommender systems. We have illustrated a big picture on different research approaches towards fashion recommender systems. We introduced the trajectory of studies in fashion recommender systems from the very beginning. The main categories have been defined.

CHAPTER 12

12. FUTURE SCOPE

Future works in the case of Personalized Fashion Recommendation Systems are the utilization of the user-preferred location to get fashion recommendations based on existing products established in nearby areas. This can be done by extracting the latitudes and longitudes of the user-preferred location and computing the Euclidean distances between the latitudes and longitudes of the organization location. This filters out other products that fall far from the user-preferred location and gives a more accurate fashion recommendation. We suggest some future research directions for fashion recommender systems. Considering the rapid growth of multimedia data, where visual information will be the critical component. More in depth research in applications of multi-model fusion and multi-task learning in fashion recommender systems are required to model recommender system to be capable of profiling users comprehensively. Besides, while the majority of researches in fashion recommender systems is mainly based on similarity based retrieval techniques, there is a need for more studies in the development of new functions such as designing clothes, which are highly demanded in future fashion recommender systems. Furthermore, most of the current fashion datasets do not contain outfit compatibility annotations, or they are limited in terms of size and the type of annotations they provide.

CHAPTER 13

13. APPENDIX Source Code GitHub & Project Demo Link

Github Link: https://github.com/IBM-EPBL/IBM-Project-45861-1660732843

Project Demo Link: https://youtube.com/watch?v=prv3u2sPOWc&feature=share