

PROJECT REPORT
CLOUD APP DEVELOPMENT
SMART FASHION RECOMMENDER
APPLICATION

TEAM ID: PNT2022TMID35310

TEAM MEMBERS:

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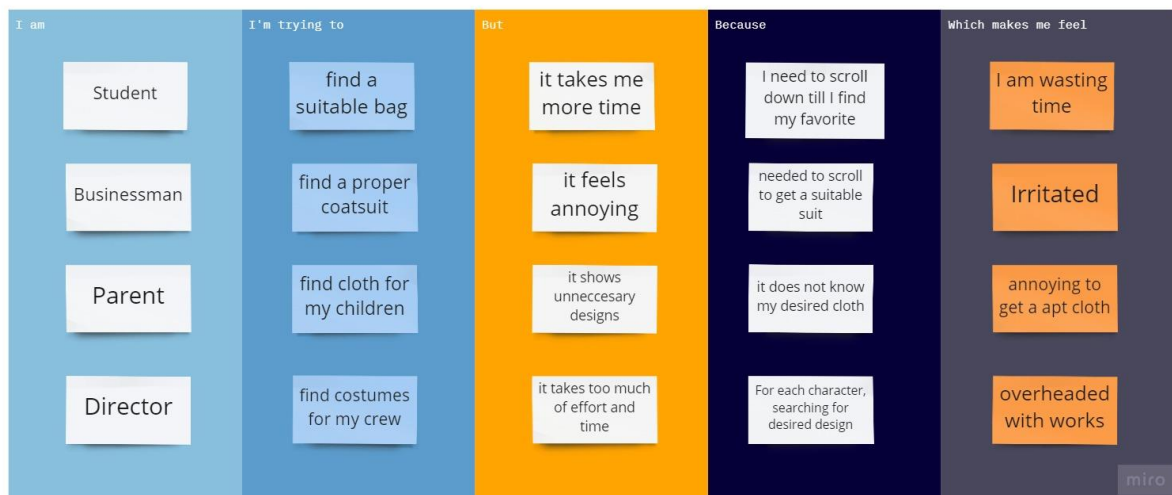
Srihari T - 2019103586

Araventh M - 2019103508

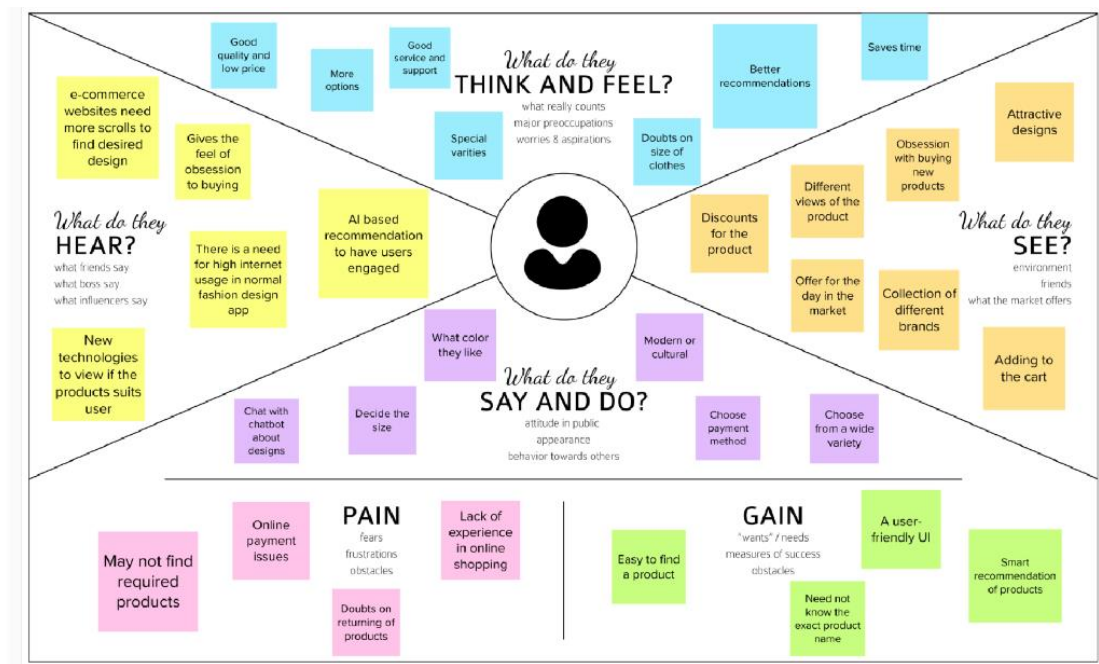
Bharath B – 2019103010

Problem Statement:

| Problem Statement (PS) | I am (Customer) | I'm trying to | But | Because | Which makes me feel |
|------------------------|-----------------|----------------------------|--------------------------------------|--|-----------------------------|
| PS-1 | Student | Find a suitable bag | It takes me more time | I need to scroll down till I find my favourite | I am wasting time |
| PS-2 | Businessman | Find a proper coatsuit | It feels annoying | Needed to scroll to get a suitable suit | Irritated |
| PS-3 | Parent | find cloth for my children | It shows unnecessary designs | It does not know my desired cloth | Annoying to get a apt cloth |
| PS-4 | Director | find costumes for my crew | It takes too much of effort and time | For each character searching for desired designs | Overheaded with works |



Empathy Map:



Brainstorm & Idea Prioritization:

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

⌚ 10 minutes to prepare
🕒 1 hour to collaborate
👥 2-8 people recommended

Before you collaborate
A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

- Team gathering**
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.
- Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.
- Learn how to use the facilitation tools**
Use the Facilitation Superpowers to run a happy and productive session.

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1 Define your problem statement
What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes

PROBLEM

How might we [your problem statement]?

Key rules of brainstorming
To run an smooth and productive session

- Stay in topic.
- Defer judgment.
- Go for volume.
- Encourage wild ideas.
- Listen to others.
- If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

2

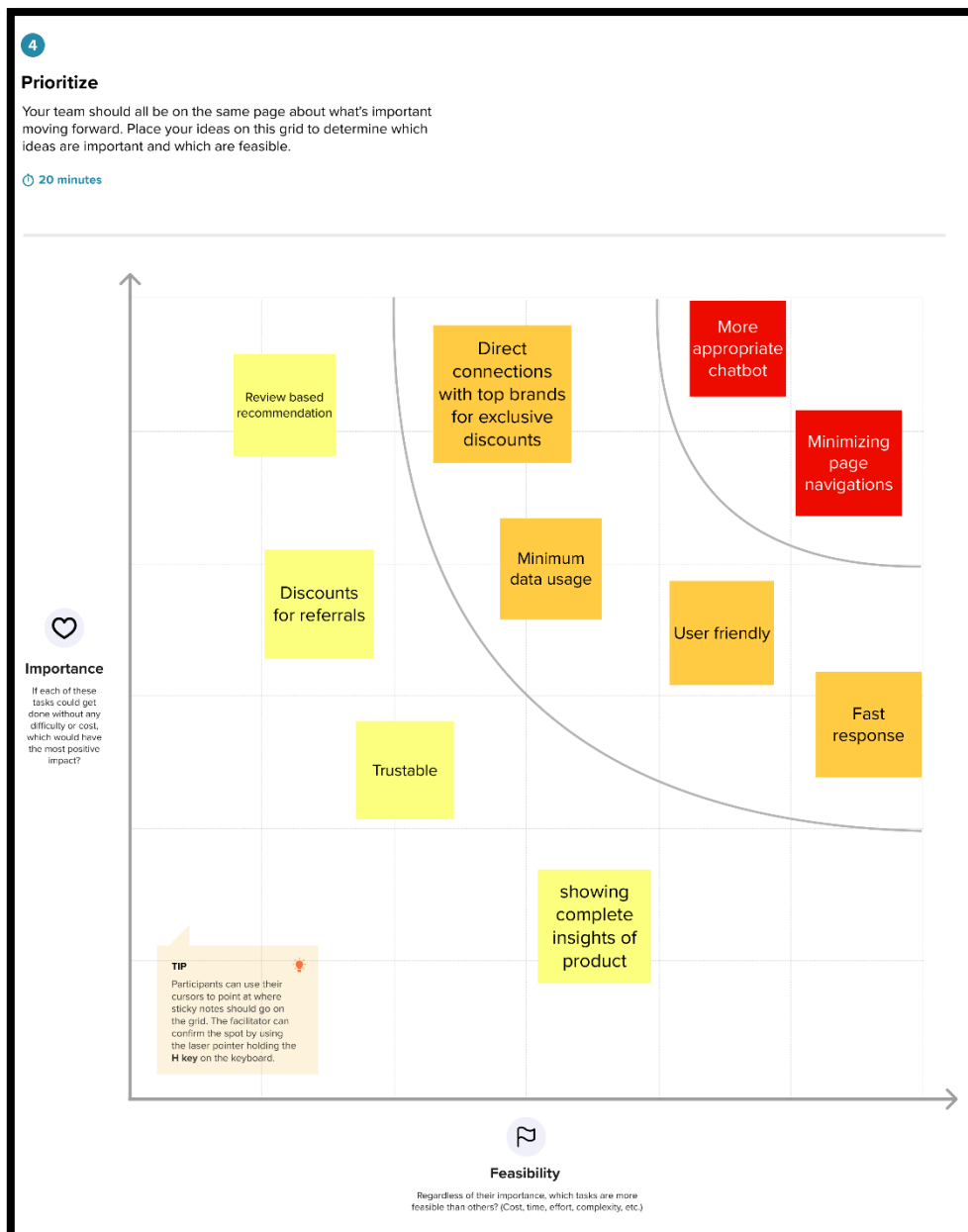
Brainstorm
Write down any ideas that come to mind that address your problem statement.
 10 minutes

TIP
You can select a sticky note and hit the pencil icon to sketch/ icon to start drawing!

| Araventh | Srihari | Guru | Bharath |
|-------------------------------------|--------------------------------------|----------------------------------|--|
| Easily manageable application | Minimizing page navigations | More appropriate trained chatbot | Direct connections with top brands for exclusive discounts |
| User friendly | Recommend complementaries | Robustness | showing complete insights of product |
| Light weight application | get products just by saying features | Discounts for referrals | Review based recommendation |
| Feeling like virtual shop attendant | Fast response | Minimum data usage | Trustable |



Step-3: Idea Prioritization



LITERATURE SURVEY:

1) Personalized fashion recommender system with image based neural networks

Personalized Fashion Recommender system that generates recommendations for the user based on an input given. Unlike the conventional systems that rely on user's previous purchases and history, this project aims at using an image of a product given as input by the user to generate recommendations since many-a-time people see something that they are interested in and tend to look for products that are similar to that. It use neural

networks to process the images from DeepFashion dataset and a nearest neighbour backed recommender to generate the final recommendations.

2) An Intelligent Personalized Fashion Recommendation System

The proposed system significantly helps customers find their most suitable fashion choices in mass fashion information in the virtual space based on multimedia mining. There are three stand-alone models developed in this paper to optimize the analysis of fashion features in mass fashion trend: (i). Interaction and recommender model, which associated clients' personalized demand with the current fashion trend, and helps clients find the most favorable fashion factors in trend. (ii). Evolutionary hierarchical fashion multimedia mining model, which creates a hierarchical structure to filter the key components of fashion multimedia information in the virtual space, and it proves to be more efficient for web mass multimedia mining in an evolutionary way. (iii). Color tone analysis model, a relevant and straightforward approach for analysis of main color tone as to the skin and clothing is used. In this model, a refined contour extraction of the fashion model method is also developed to solve the dilemma that the accuracy and efficiency of contour extraction in the dynamic and complex video scene. As evidenced by the experiment, the proposed system outperforms in effectiveness on mass fashion information in the virtual space compared with human, and thus developing a personalized and diversified way for fashion recommendation.

3) Interactive Design Recommendation Using Sensor Based Smart Wear and Weather WebBot

The interactive design recommendation using the sensor based smart wear and the weather WebBot (DRS-WB) is proposed. The proposed method is increasing the efficiency of merchandising for human-oriented sensibility product designs. Development of the DRS-WB included a user interface and collaborative filtering of textile and fashion designs to satisfy the user's needs. Collaborative filtering is used to recommend designs of interest for users based on predictive relationships discovered between the current user and other previous users. Current weather information is simultaneously acquired from the sensor based smart wear and the weather WebBot. The sensor based smart

wear is fabricated as a way of non-tight and comfortable style fitting for the curves of the human body based on clothes to wear in daily life.

4) Intelligent travel chatbot for predictive recommendation in echo platform

Chatbot is a computer application that interacts with users using natural language in a similar way to imitate a human travel agent. A successful implementation of a chatbot system can analyze user preferences and predict collective intelligence. In most cases, it can provide better user-centric recommendations. Hence, the chatbot is becoming an integral part of the future consumer services. This paper is an implementation of an intelligent chatbot system in travel domain on Echo platform which would gather user preferences and model collective user knowledge base and recommend using the Restricted Boltzmann Machine (RBM) with Collaborative Filtering. With this chatbot based on DNN, we can improve human to machine interaction in the travel domain.

Proposed Solution:

| S.No. | Parameter | Description |
|-------|--|--|
| 1. | Problem Statement (Problem to be solved) | In normal buying applications (like amazon, flipkart), the user needed to navigate through different hectic pages to buy their desired specification products (like clothes, watches) and also need to navigate through various pages for further steps like offers and feedback for products. |
| 2. | Idea / Solution description | A chatbot which can handle the user queries through normal chat like in Whatsapp, and proceed with different steps like viewing offers, getting user choices for choosing designs, proceeding with payments and feedback in chat itself . |
| 3. | Novelty / Uniqueness | Most the purchasing platforms are complex with various features displayed using front end leading to different hectic pages rather than a simple chatbot to get all the features using chat. The chatbot also recommend products based on recently bought products. |
| 4. | Social Impact / Customer Satisfaction | Moving from native buying online web applications to compact chatbots which also gives customer a friendly conversation to buy |

| | | |
|----|--------------------------------|---|
| | | their desired products. |
| 5. | Business Model (Revenue Model) | Showing the daily offers in timely intervals in chat and the friendly toned chatbot gives users to buy more items which induces more revenue. |
| 6. | Scalability of the Solution | Since the proposed solution is simple chatbot it does take more data exchanges for showing unnecessary designs rather show user preferring designs. Also, the IBMDB2 database is more scalable for queries and data, hence as the user and query count increases, user does not feel the traffic in their chat. |

Proposed Solution Fit:

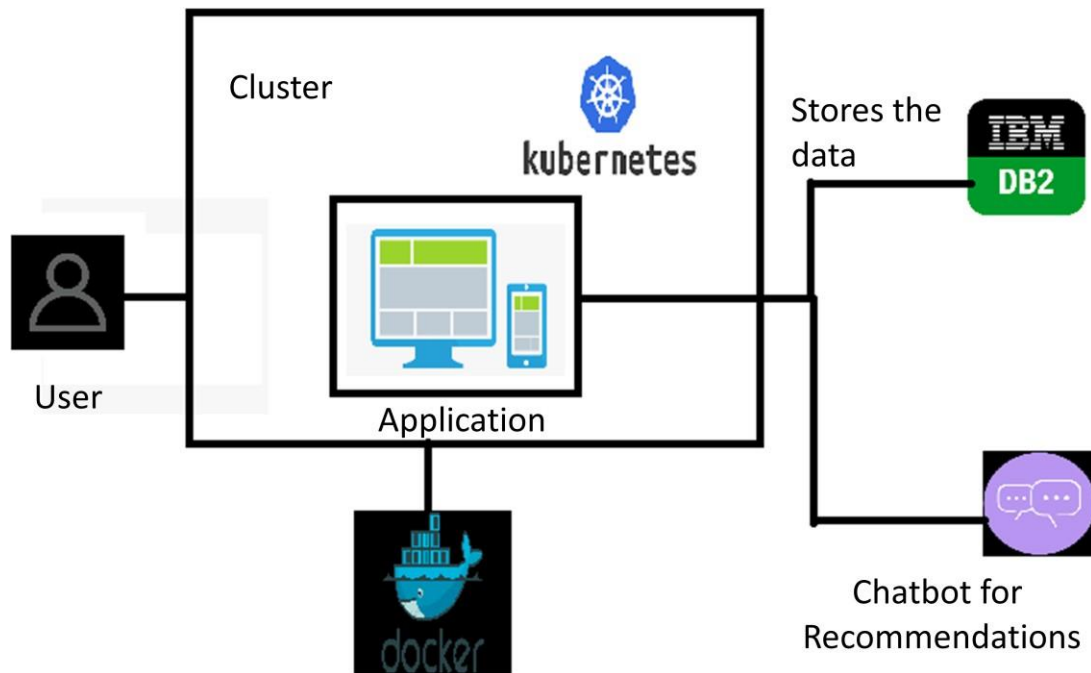
Project Title: Smart Fashion Recommender Application

Project Design Phase-I - Solution Fit Template

Team ID: PNT2022TMID35310

| | | | | |
|-------------------------|---|---|--|---------------------------|
| Define CS, fit into CC | 1. CUSTOMER SEGMENT(S) CS <ul style="list-style-type: none"> Customer who are interested on latest trending fashion items and also purchasing items through interaction | 6. CUSTOMER CONSTRAINTS CC <ul style="list-style-type: none"> Customer need to have proper network connection to use the application. Items may take 2-3 days for delivery. | 5. AVAILABLE SOLUTIONS AS <ul style="list-style-type: none"> Chatbot is used to interact with the customer to know the interests and needs of the customer This is a good alternative to the traditional method of searching for products. | Explore AS, differentiate |
| | 2. JOBS-TO-BE-DONE / PROBLEMS J&P <ul style="list-style-type: none"> Better recommendation of the product based on the customer requirement and interest along with best offers. Helping the customer to have track of the product they ordered. Helping the admin in collecting customer feedback | 9. PROBLEM ROOT CAUSE RC <ul style="list-style-type: none"> Best remote shopping experience 24/7 available customer service. | 7. BEHAVIOUR BE <ul style="list-style-type: none"> Customer Data Integrity. Interaction based purchasing. | |
| Identify strong TR & EM | 3. TRIGGERS TR <ul style="list-style-type: none"> Less Customer Service Cost Better Customer Satisfaction. | 10. YOUR SOLUTION SL <ul style="list-style-type: none"> Chatbot based recommendation over the traditional search based recommendation gives the customer better suggestion of product and satisfaction of buying product through interaction | 8. CHANNELS of BEHAVIOUR CH 8.1 ONLINE <ul style="list-style-type: none"> Serve customer with consistent level of quality 8.2 OFFLINE <ul style="list-style-type: none"> Make sure the customer is aware of the availability of chatbot and its usage. | Identify strong TR & EM |
| | 4. EMOTIONS: BEFORE / AFTER EM <ul style="list-style-type: none"> Took longer time to process adn request query. | | | |

SolutionArchitecture:



Functional Requirements:

Following are the functional requirements of the proposed solution.

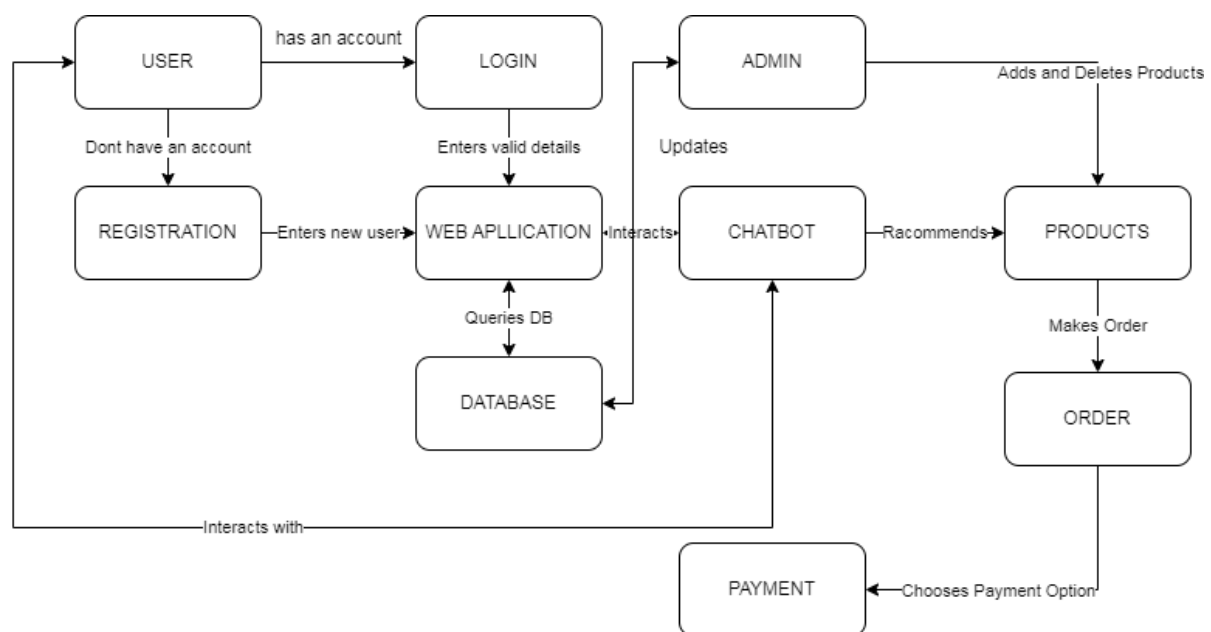
| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|--------|-------------------------------|---|
| FR-1 | User registration | For creating account for the user, user would be rendered a form to fill in their details. |
| FR-2 | User confirmation | Confirming the user's identity using confirmation mail to registered email or via OTP to registered phone number. |
| FR-3 | Sign in | Signing into their account |
| FR-4 | Default options | The chat box will be having few default options like search an item, show offers, etc. |
| FR-5 | Map | Shows the currently ordered item status like location. |
| FR-6 | Bot | Takes care of ordering, processing the user chat into action with a confirmation with user. |
| FR-7 | Choice viewer | Shows the filtered images for the user given design and choices for a particular product in image format. |
| FR-8 | Payment | Dealing with the payment for products in orders. |
| FR-9 | Feedback | To process the feedback and coordinate with producers or services. |

Non-functional Requirements:

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

| FR No. | Non-Functional Requirement | Description |
|--------|----------------------------|---|
| NFR-1 | Usability | Compact, fast and easy to use through simple chats, rather than confusing navigation tabs. |
| NFR-2 | Security | The user purchase and order details will be secure with encryption. |
| NFR-3 | Reliability | Databases use ACID properties so no problem in atomicity of transactions while buying or returning products. |
| NFR-4 | Performance | High performance, ability to run large concurrent activities. |
| NFR-5 | Availability | Available all times, when one node (datastore) is not available, another node has the required data. |
| NFR-6 | Scalability | Highly scalable as more user and data included just need to extend with more nodes rather than increasing the computation of systems. |

Data Flow Diagram:



User Stories

| User Type | Functional Requirement (Epic) | User Story Number | User Story / Task | Acceptance criteria | Priority | Release |
|-----------|-------------------------------|-------------------|---|---|----------|----------|
| Customer | 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 Facebook | I can register & access the dashboard with Facebook Login | Low | Sprint-2 |
| | | USN-4 | As a user, I can register for the application through Gmail | | Medium | Sprint-1 |
| | Login | USN-5 | As a user, I can log into the application by entering email & password | | High | Sprint-1 |
| | Dashboard | USN-6 | As a user, I can navigate and choose options required | | Medium | Sprint-3 |
| | Chatbot | USN-7 | As a user, I can chat with chatbot to get recommendations | I can get recommendations | High | Sprint-2 |
| Admin | Login | USN-8 | As an admin, I can log into the application by entering email & password | | High | Sprint-1 |
| | IBM DB2 | USN-9 | As an admin, I can add and delete the products | | High | Sprint-2 |

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

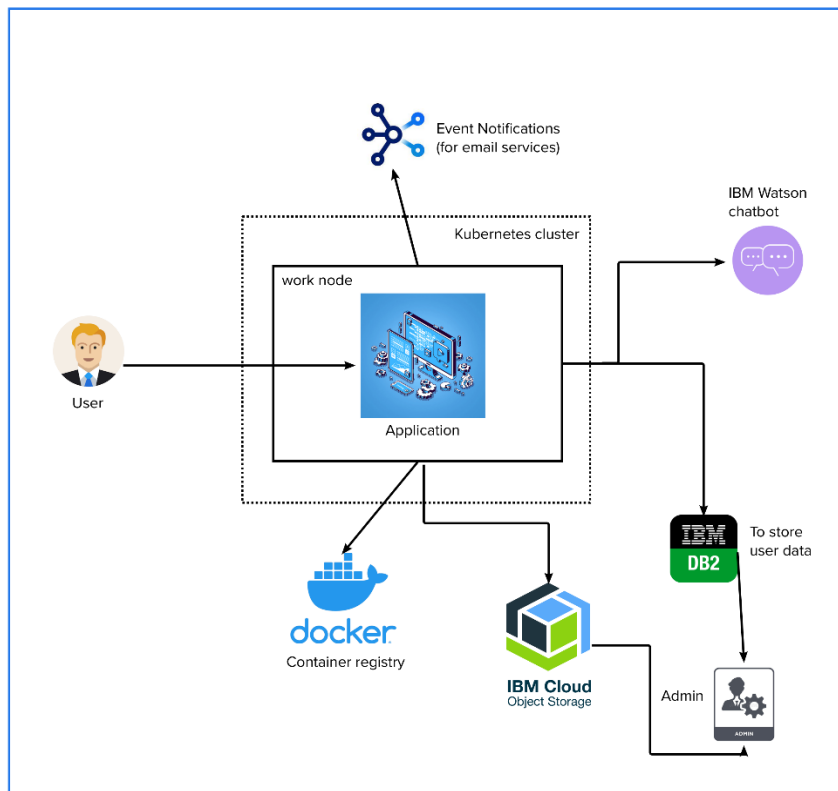


Table-1 : Components & Technologies:

| 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. | Event Notifications | For verification of user and email services | Event Notifications |
| 3. | Docker container registry | For storing the application inside a node, which in turn put in a container registry | Docker |
| 4. | Object Storage | For storing files and data which are not in text form | IBM Cloud Object Storage |
| 5. | Cloud Database | Database Service on Cloud for storing user informations | IBM DB2 |
| 6. | Chatbot | Taking input message, finding its indent, selecting proper products according to indent or choices from user, returning list of appropriate products | IBM Watson Chatbot |
| 7. | Infrastructure (Server / Cloud) | Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration : | Local, Cloud Foundry, Kubernetes, etc. |

Table-2: Application Characteristics:

| S.No | Characteristics | Description | Technology |
|------|--------------------------|--|------------------------------------|
| 1. | Open-Source Frameworks | Docker | Technology of Opensource framework |
| 2. | Security Implementations | User authentication using email services from Event notifications. | Event Notifications |
| 3. | Scalable Architecture | Handles huge requests and data | Docker, Kubernetes |
| 4. | Availability | Available 24*7 through Chatbot, Kubernetes (manages nodes) | IBM Watson chatbot, Kubernetes |
| 5. | Performance | Fast and recommend appropriate products through AI powered chatbot | IBM Watson chatbot |

Customer Journey:

