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***Abstract*—**In today's fast-paced world, managing household chores while balancing work, family, and personal commitments can be overwhelming. Finding reliable and efficient domestic help for tasks like cleaning, cooking, childcare and other household services is a challenge for many families, so our project Work-Ease aims to create a platform that connects households with trusted service providers such as maids, cleaners, cooks, and babysitters.

Our platform will work as a one-stop solution for managing household needs by connecting users with verified professionals for everyday domestic tasks. It will allow our users to easily browse, compare, and book services based on their requirements, budget, and personal preferences. To make our user's experience safe and convenient, the platform will include features such as real-time availability, secure payment options, background verification of service providers, and customer reviews for informed decision-making

Benefits: Our project will be especially helpful for urban households, working professionals, elderly individuals, and single parents who need a helping hand in their household work. By introducing a structured, technology-driven solution, the platform aims to transform the unorganized domestic service sector while also creating employment opportunities for skilled and semi-skilled workers.

Furthermore, the platform will make sure to prioritize user safety by implementing strict verification processes, identity checks, and training programs for service providers. We will also introduce customer feedback methods to ensure continuous improvement in service quality.

From a business perspective, the platform will generate revenue through a commission-based model, where a small percentage of the service fee is charged to service providers. Additional income generation options will include subscription plans, premium listings for professionals, and partnerships with corporate organizations.

As we move forward with the development of the platform, we will focus on using advanced technologies such as Artificial Intelligence and data analytics to improve the overall user experience, efficiently match users with suitable service providers, and enhance our operational efficiency.

Keywords—component, formatting, style, styling, insert (*key words****)***

I. INTRODUCTION (*HEADING 1*)

In today's busy and fast-paced lifestyle, managing household responsibilities along with work and personal commitments has become challenging for many families. Finding trustworthy and skilled domestic help for services such as cleaning, cooking, childcare, and elderly care is often difficult due to the unorganized nature of the domestic service sector.

Work-Ease is designed as a digital platform that connects households with verified domestic service providers. The platform allows users to easily browse, compare, and book professionals based on their needs, budget, and preferences. By incorporating features such as background verification, secure payments, real-time availability, and customer reviews, Work-Ease aims to provide a safe, reliable, and convenient solution for managing household services while also creating better employment opportunities for service providers.

II. LITERATURE SURVEY

Models and Methods Implemented by Existing Platforms

1. Sulekha: Operates primarily as a directory-based and lead-generation platform. It connects users to a large database of vendors through location-based searches, where users can browse service providers using reviews and ratings
2. Urban Company: Follows an end-to-end service model. This includes standardized and fixed pricing, an app-based booking experience, and the use of background-verified, trained professionals.

3. Zimmber & Housejoy: Both provide on-demand home services focusing on convenience. Zimmber utilizes verified professionals, while Housejoy uses a mix of in-house staff and third-party vendors for end-to-end service execution.

Drawbacks Faced by Users

Pricing and Transparency:

- Urban Company is often viewed as expensive compared to local providers.
- Housejoy has been criticized for a lack of pricing transparency, with users sometimes facing unmentioned additional charges.

User Experience Issues:

- Sulekha users often experience frustration due to receiving multiple spam calls from different vendors after making a request.
- Many platforms, including Sulekha and Premend, lack real-time service tracking.
- Urban Company offers limited flexibility for users to customize services according to specific personal preferences.

Our Idea and Test Case

TEST CASE:

The main idea tested in this project was that a text based similarity model using TF- IDF and Nearest Neighbours could correctly match user requirements with the most suitable domestic workers . The goal was to check whether the system could understand user need based on skills , locations, availability and types of work. To test this , different real-life user scenarios were created.

IDEA:

The final TF-IDF and Nearest neighbours recommendation model showed good results in both accuracy and speed .when tested using 50 different queries we found 86% of the recommendations closely matched what the users were looking for. We have also added a subscription model to our website where one can subscribe for any houseold services. The subscription is for different time periods such as 1 month or 3 months. Once the person has taken a subscription, all our services will be available/included within it. And our ML model recognize what services the client is taking the next time recommnedation will be popped at first.

To make the recommendation system work better ,different settings were tested for both the TF-IDF and nearest neighbours models. For TF-IDF , various n-grams options were tried and two word setting worked best . We could achieve this as it clearly understood the common phrases like ‘Chinese food’ ,’deep cleaning’ and ‘newborn care’ . Other settings were also adjusted to keep the important words and information.

For the Nearest Neighbours model different numbers of recommendations are tested simultaneously.This helped to show the best 5 workers for the job asked by users.this reduces the confusion in the mind of user. Cosine similarity worked better than other methods because it compares text-based data more accurately

III. Proposed System

The design of WorkEase is very scalable, easy to use which helps providing an efficient experience for users. The system is made up of several parts, such as the frontend, backend, database and external integrations. The points below give a clear overview of the overall architecture and its main components

1. User Interface (UI) Layer

The user interface layer provides a smooth and easy experience. It includes:

- Web Application: Help users who prefer to access the platform through a web browser.
- Admin Dashboard: Helps platform manager manage service requests and review analytical reports.
- Chatbot: Interactive chatbot that. provides 24hrs service that enhance users experience

2. Backend Layer (Business Logic)

The backend layer manages registrations, user logins, assigning worker to achieve users requirement. Its main features are:

- User Authentication & Role Management: Provides safe login for users, service partners by saving details securely in database.
- Service Request Management: It looks after the services or booking made by users.
- TF-IDF: It helps users to match them with the best suitable service provider based location and who is currently available.
- Feature Engineering:It is the crucial process of transforming the raw data into meaningful inputs variables that helps machine learning model to learn patterns.

3. Database Layer

The database stores all the information related to users and services. It includes:

- Booking & Transaction Data: It keeps track of all booking services, payments, etc.
- User Profiles & History: It stores the past record of the user and the services he/she has made it.
- Service Provider Information: It stores the details about service providers, whether they are available or not.

4. AI & Analytics Engine

The AI engine helps the platform by giving personal suggestion , catching fraud activities. Its main parts are:

- Smart Service Matching: It Uses machine learning technique for best suitable service available.
- Predictive Analytics: It looks upon the previous trend of the user for further booking.
- User Behaviour Analysis: It tells that how users interact with the platform so that the design and services can be improved.

IV. Results and Discussion

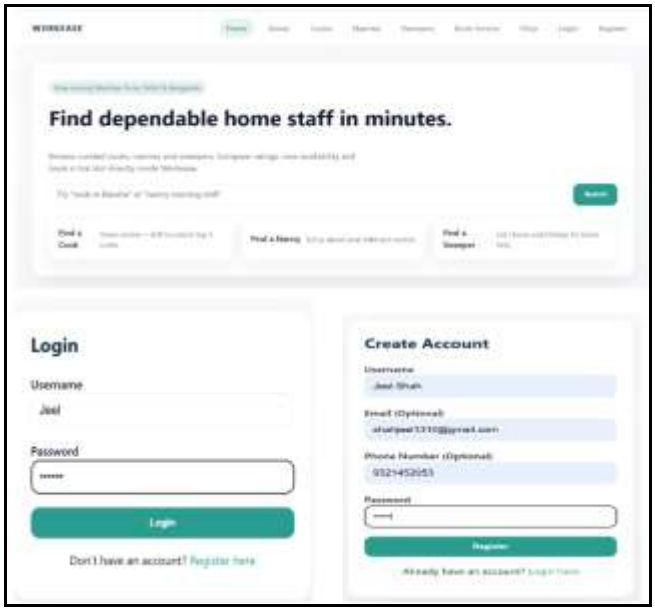
Flowchart of execution

IV.1Flowchart

The above flowchart shows a service platform which links through a mobile or web app. After users are logged in request are handled through Real-time tracking and AI based matching. Google maps are used for real-time tracking, alerts while payment can be implemented with the help of razor pay/stripe.

GUI Design

The Work ease platform is a platform that helps the users to find the best compatible match for their need. The design is simple to understand and easy to work with. It allows the users to find what they are looking for with one click. For example, if the user is trying to find a cook who can make the Chinese food and is also good at making jain food, and full-time cook, this kind of request is sent to the system to get a suitable service provider. Once the search is complete, the platform shows the top 5 recommended workers who are skilled at their job. Every worker's information is displayed in card format, which includes details like location, experience, name, job role and specific skills like cooking expertise or childcare experience. This makes it easy for users to quickly read, compare and choose the best option. We also provide a price filter, which helps users find a cook, nanny or sweeper based on selected price range.



5.1.1 Website login signup

6.1 Datasets

The WorkEase project have three structured datasets such as Nannies, Cooks and Sweepers. Each dataset contains 5000 records, making total of 15000 domestic worker profiles. These datasets includes both personal and work related details like name, age, gender, experience, services offered, language, locality and salary expectations.

Each dataset also has a role specific field that describes the worker's skills in more details. For example, the nannies dataset includes specializations like newborn care, toddler care and special need support. The cooks dataset includes fields such as cuisine specialty and meal types and sweeper includes work type and house type experience.

All the datasets include four shift availability columns namely (9-12, 12-3 ,3-6 and 17-19). This helps the system to match the workers with users based on their preferred working time. Since the datasets contains many text-based fields like text-based machine learning approach. During preprocessing all three datasets are merged into a single providers table, allowing the recommendation model to be trained and tested in a unified manner.

a)Cook Dataset

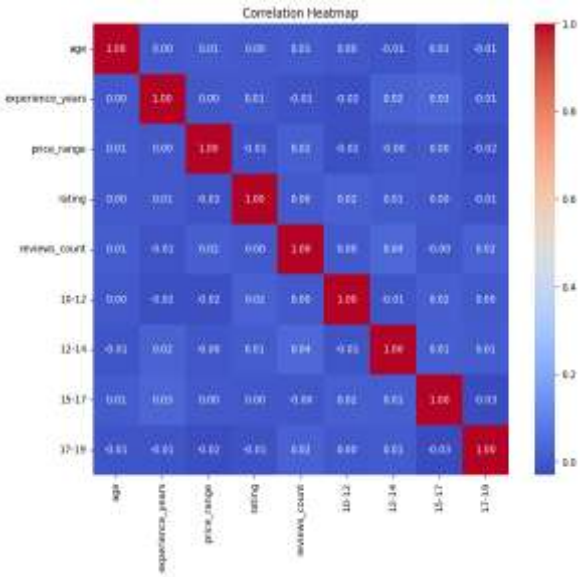
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5000 entries, 0 to 4999
Data columns (total 20 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   cook_id            5000 non-null   object
 1   name               5000 non-null   object
 2   age                5000 non-null   int64
 3   gender             5000 non-null   object
 4   experience_years   5000 non-null   int64
 5   specialization     5000 non-null   object
 6   role_type          5000 non-null   object
 7   services_offered   5000 non-null   object
 8   locality           5000 non-null   object
 9   availability       5000 non-null   object
 10  price_range        5000 non-null   int64
 11  food_features      5000 non-null   object
 12  rating             5000 non-null   float64
 13  reviews_count      5000 non-null   int64
 14  languages_spoken   5000 non-null   object
 15  status             5000 non-null   object
 16  10-12              5000 non-null   int64
 17  12-14              5000 non-null   int64
 18  15-17              5000 non-null   int64
 19  17-19              5000 non-null   int64
dtypes: float64(1), int64(8), object(11)
memory usage: 781.4+ KB
```

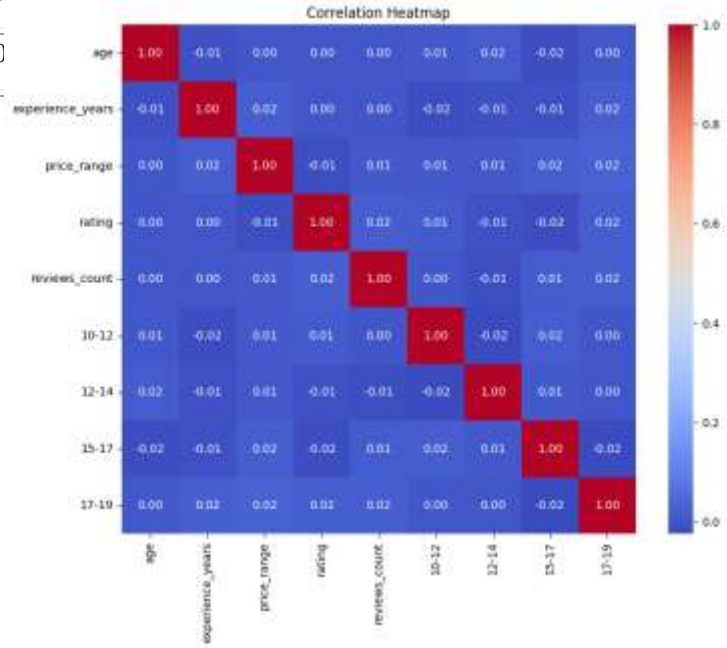
Sweeper dataset

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5000 entries, 0 to 4999
Data columns (total 19 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   sweeper_id         5000 non-null   object
 1   name               5000 non-null   object
 2   age                5000 non-null   int64
 3   gender             5000 non-null   object
 4   experience_years   5000 non-null   int64
 5   specialization     5000 non-null   object
 6   role_type          5000 non-null   object
 7   services_offered   5000 non-null   object
 8   locality           5000 non-null   object
 9   availability       5000 non-null   object
 10  price_range        5000 non-null   int64
 11  rating             5000 non-null   float64
 12  reviews_count      5000 non-null   int64
 13  languages_spoken   5000 non-null   object
 14  status             5000 non-null   object
 15  10-12              5000 non-null   int64
 16  12-14              5000 non-null   int64
 17  15-17              5000 non-null   int64
 18  17-19              5000 non-null   int64
dtypes: float64(1), int64(8), object(10)
memory usage: 742.3+ KB
```

	age	experience_years	price_range	rating
count	5000.000000	5000.000000	5000.000000	5000.000000
mean	38.542800	10.466400	12735.374000	4.258100
std	9.774604	5.745805	7020.900004	0.435360
min	22.000000	1.000000	509.000000	3.500000
25%	30.000000	5.000000	6774.250000	3.900000
50%	38.000000	11.000000	12572.500000	4.300000
75%	47.000000	15.000000	18814.500000	4.600000
max	55.000000	20.000000	25000.000000	5.000000

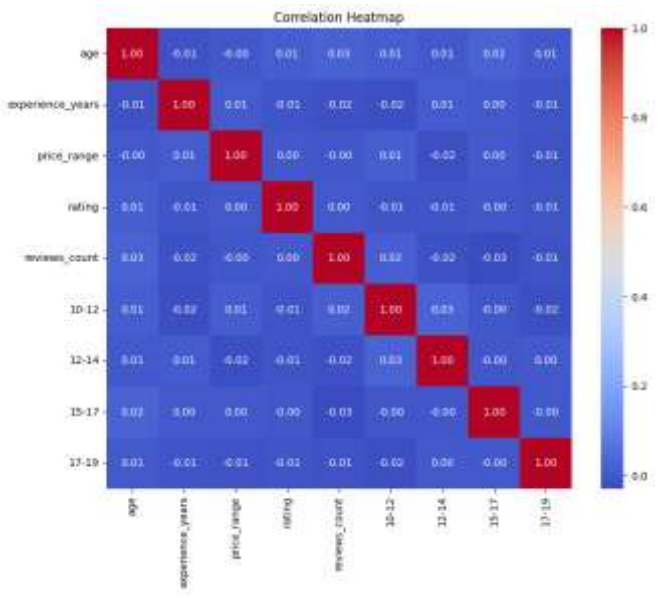
	reviews_count	10-12	12-14	15-17	17-19
count	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000
mean	253.527400	0.499800	0.498200	0.486800	0.500000
std	141.202695	0.500047	0.500047	0.499876	0.500050
min	1.000000	0.000000	0.000000	0.000000	0.000000
25%	131.000000	0.000000	0.000000	0.000000	0.000000
50%	255.000000	0.000000	0.000000	0.000000	0.000000
75%	373.000000	1.000000	1.000000	1.000000	1.000000
max	500.000000	1.000000	1.000000	1.000000	1.000000





```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5000 entries, 0 to 4999
Data columns (total 19 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   nanny_id          5000 non-null   object
 1   name              5000 non-null   object
 2   age               5000 non-null   int64
 3   gender            5000 non-null   object
 4   experience_years  5000 non-null   int64
 5   specialization    5000 non-null   object
 6   role_type         5000 non-null   object
 7   services_offered  5000 non-null   object
 8   locality          5000 non-null   object
 9   availability      5000 non-null   object
 10  price_range       5000 non-null   int64
 11  rating            5000 non-null   float64
 12  reviews_count     5000 non-null   int64
 13  languages_spoken  5000 non-null   object
 14  status            5000 non-null   object
 15  10-12             5000 non-null   int64
 16  12-14             5000 non-null   int64
 17  15-17             5000 non-null   int64
 18  17-19             5000 non-null   int64
dtypes: float64(1), int64(8), object(10)
memory usage: 742.3+ KB
```

	age	experience_years	price_range	rating	reviews_count	10-12	12-14	15-17	17-1
count	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5000.00
mean	34.917400	7.992400	24073.469400	4.007140	152.494400	0.502200	0.498000	0.505400	0.5044
std	8.930203	4.362723	9255.294581	0.578621	84.585612	0.500045	0.500046	0.500021	0.500
min	20.000000	1.000000	8003.000000	3.000000	5.000000	0.000000	0.000000	0.000000	0.000
25%	27.000000	4.000000	16108.750000	3.500000	78.000000	0.000000	0.000000	0.000000	0.000
50%	35.000000	8.000000	24259.500000	4.000000	154.000000	1.000000	0.000000	1.000000	1.000
75%	43.000000	12.000000	32041.750000	4.500000	226.000000	1.000000	1.000000	1.000000	1.000
max	50.000000	15.000000	39993.000000	5.000000	300.000000	1.000000	1.000000	1.000000	1.000



Results

The final TF-IDF and Nearest neighbours recommendation model showed good results in both accuracy and speed. When tested using 50 different queries we found 86% of the recommendations closely matched what the users were looking for. The system was also fast responding to each query efficiently which makes WorkEase suitable for real world web applications. The similarity scores of the top recommendations clearly showed strong matches, especially when users mentioned specific details like location, availability, time slots and specialties like type of cook, nanny for how many years old child and even the sweeper for household chores.

V. Conclusion

The WorkEase project makes the process of finding a compatible service provider easy and simple by clearly presenting important information such as the worker's skills, tasks to be done,experience and availability. This helps users understand their options better and makes the hiring process faster and more convenient . By using structured datasets,machine learning techniques and clean user interface .

This helps system to understand the user requirements written in natural language and recommend a suitable cook,nanny or sweeper.

WorkEase also focuses on improving the overall user experience . A 24hr chatbot is available to help users find the solutions to their problems at any time. The platform includes a search page that allows the background workers, helping build trust and a stronger connection between users and service providers . In addition,the platform offers new receipies for the users to explore adding extra value beyond just hiring services.

VI. Future Scope

The household platform is designed to cover wide range of areas, including homes, businesses and services. Its main goal is to make daily house old tasks easier by providing a digital system that allows users to connect with service providers. This 12 platform is not only meant for people living in cities, but it can be also used for semi-urban and rural areas.

The Major focus of this project is the residential sector. The platform supports services to homeowners, elderly individuals, and families who need any help with household chores. Through both on-demand and subscription options, it offers an easy way for assistance, especially for users who have limited time. The project also covers the commercial sector, including offices, businesses, and rental properties.

Workplaces often need regular cleaning and maintenance, and this platform provides best service plans to help them stay clean.

Another important part of the project is event-based services. It will support people and organizations that need professional help for weddings, parties, or corporate functions. Users can book our services in advance, such as dishwashing, or any help-with catering.

The platform also offers strong technological features. It uses live tracking, and automatic scheduling to improve the user experience. As it can be used through both mobile

applications and web platforms, it is very easy to access and operate.

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