



# **Content and Collaborative based Sinhala Book Recommendation System**

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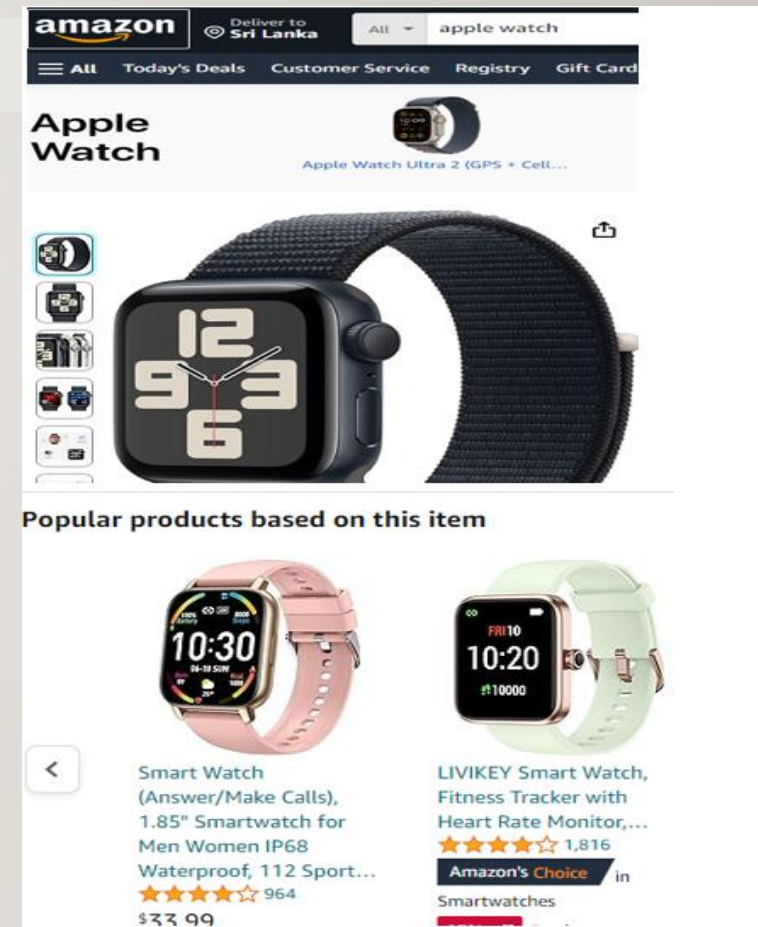
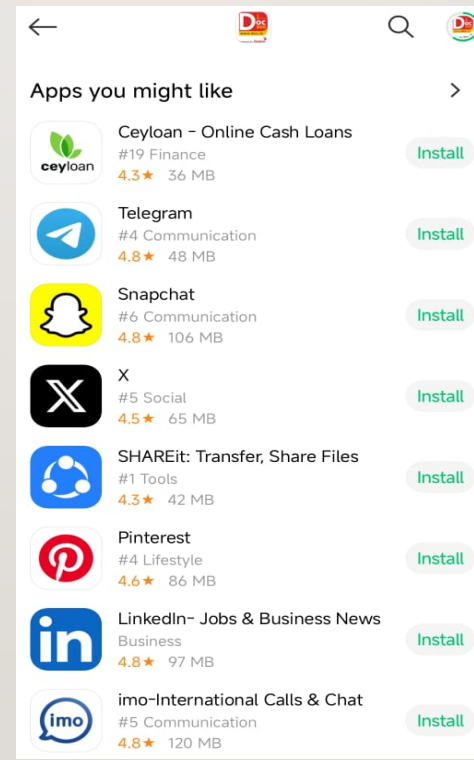
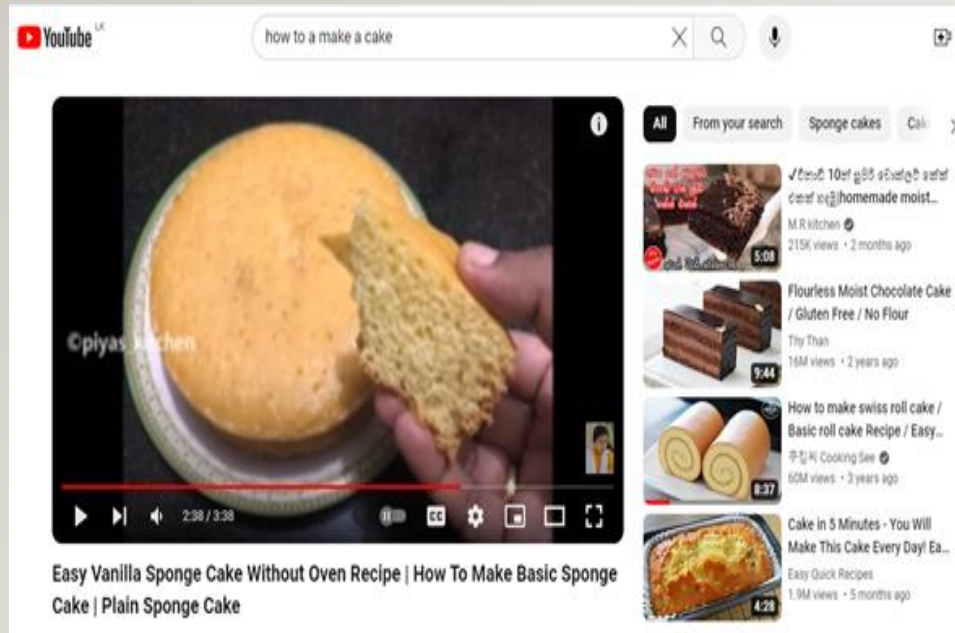
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**19440677 / 2019/MCS/067**

**Supervised by:  
Prof. M.G.N.A.S. Fernando**

# RECOMMENDATION SYSTEMS

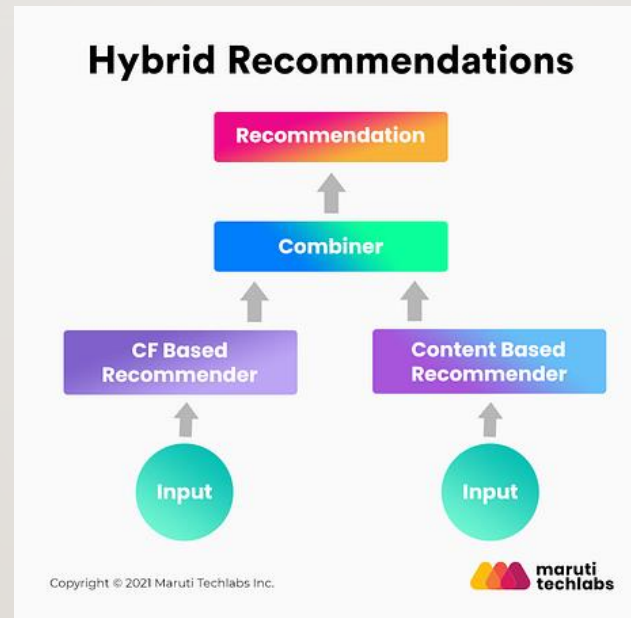
A recommendation system is a computer program that recommends items for users of digital platforms such as e-commerce websites and social networks





# TYPES OF RECOMMENDATION SYSTEMS

1. Collaboration Filter
2. Content Based Filter
3. Knowledge based
4. Demographic based
5. Hybrid Filter




# PROBLEM STATEMENT



# RESEARCH GAP

- Multiple application for English Book Recommendation
- Online book store limitations



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මිනී මරුවා පළපුරුදු අයෙකි. පැරිස් පොලීසියේ අපරාධ මිදර්න ඒකකයේ පොලීස් පරීක්ෂකවරු මේ අපරාධය දෙස සියත් ආකාරයෙන් බැලූහ. හිම දියව ගොස් නගරයට තිරු පායා එන්නට පෙර අපරාධය විසඳා ගත යුතුය. එහෙත් ඔවුන් ඉදිරියේ වූයේ බිඳ දැමිය නොහැකි ශක්තිමත් පවුරකි. පිටි වන්නට දොරටු නොමැති පුහුණුකාරීකම් ඔවුහු පැවැලී සිටියහ.


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# SCOPE OF THE STUDY

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- Share a Google form
- Apply sentiment analysis for the reviews
- Login and register to the application
- Display a book details when a book is selected
- List out recommended book list for the selected book

# RESEARCH QUESTIONS

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- How to find a valid dataset.
- How to apply sentiment analysis with high accurate for the review.
- What are the preprocessing steps to be carried out.
- How to apply Collaborative based approach and content based approach (hybrid).
- How to recommend list of books with highest accuracy.
- How to evaluate the system.

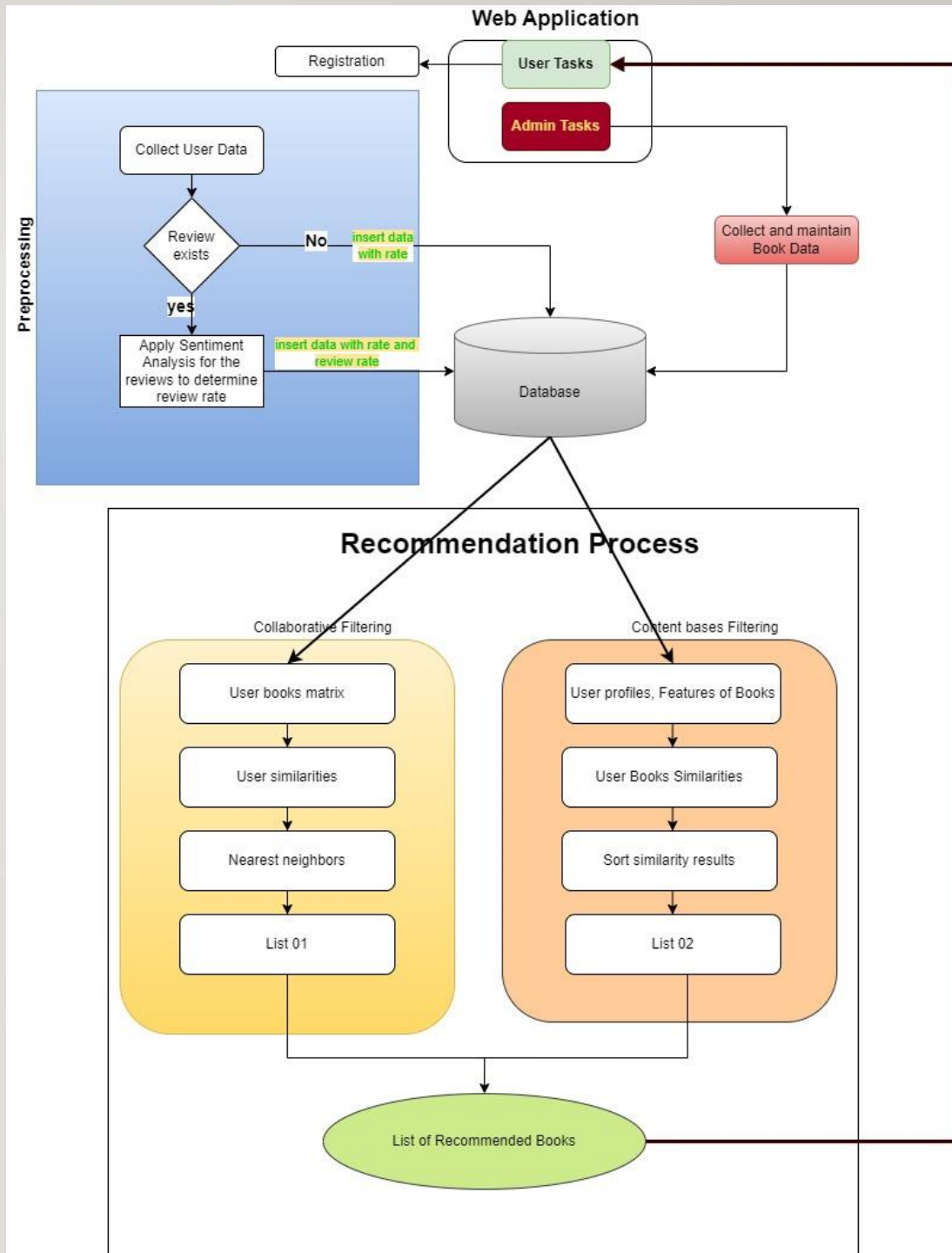
# LITERATURE WORKS

Research	Description	Technology	Limitation
Personalized Book Recommendation System using Machine Learning Algorithm - 2019 Item based Collaborative Filtering - 2019 ( <i>Shah et al., 2021</i> )	It describes all the recommendation problems like sparsity, cold start in that rated a book using the clustering details and used item based approach to implement the system. And Mean Absolute Error (MAE) used for evaluation	Clustering based approach that use item based collaborative, content collaboration approach based, hybrid.	User reviews has not been used for recommendation
An Enhanced Collaborative Filtering based Approach for Recommender Systems - 2020 Deep Learning - 2020 ( <i>Wadikar et al., 2020</i> ) ( <i>Sallam et al., 2020</i> )	It recommend books based on two approaches. Text based and image based.	Cosine Similarity and Convolutional Neural Network (CNN) based via Matrix Factorization	evaluation and validation process have not been presented in the research



# ARCHITECTURE

1. Preprocessing
2. Apply Collaborative filtering
3. Apply Content based filtering
4. Combined the result with hybrid approach



# DESIGN

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## ❑ User Interface

1. Login/logout with authenticate
2. View most rated book list
3. View most popular book list
4. Search particular book
5. Display the details of the selected book
6. Display some reviews and rate given by users for the selected book
7. List out 20 recommended books

## ❑ Backend logic

1. Python with libraries

## ❑ Database

1. Mysql - workbench

# IMPLEMENTATION

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## ❑ Pre processing

1. Google Translator to convert Sinhala review to English
2. Apply sentiment analysis – TextBlob, Vader, own mechanism
3. To identify the limitations of the project

## ❑ Quantitative

1. System
  - Collaborative via Mean Absolute Error (MAE) → **2.52**
  - Content via Artificial Neural Network (ANN) → **80%**
2. Online



# EVALUATION

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## ❑ Qualitative

1. To evaluate the novelty, scope of the proposed application
2. To evaluate whether the system provides a solution to the existing problem
3. To identify the limitations of the project

## ❑ Quantitative

1. System
  - Collaborative via Mean Absolute Error (MAE) → **2.52**
  - Content via Artificial Neural Network (ANN) → **80%**
2. Online

# FUTURE ENHANCEMENT

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- Collect more data to enhance the accuracy.
- Display the dropdown book list in Sinhala fonts in data collection form.
- Consider latest books.
- Include a book purchase facility by routing to an online book store.
- Include more filters like genre
- Include more details of a book like number of pages, published year, ISBN number

# CHALLENGES

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- To collect a data set
- Implementation
- Evaluation



# LIMITATIONS

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- The books published after 2022 were considered.
- Admin functionalities has not been integrated
- Age range has not been considered for recommendation.

# DEMO

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Sinhala Book Recommendation System

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THANK YOU