“Night - Out”

Event Recommendation & Management Using Machine Learning

2023-379
Final Presentation

The Team

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ROAD MAP

Project Intro

Research Problem & Objectives

System Overview Diagram

Commercialization

Induvidual Components

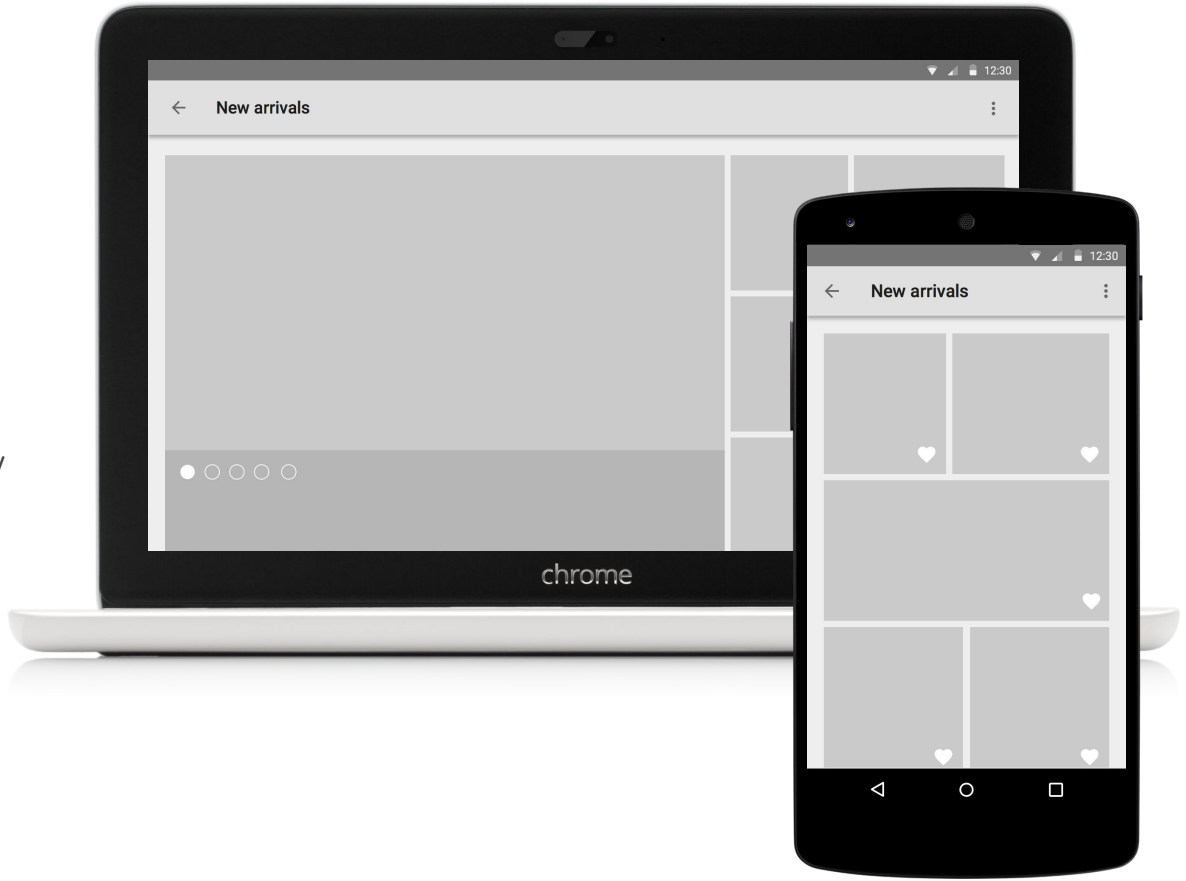
Project Introduction

A Battle against social isolation

A one-stop event finding & management application powered by machine learning.

A personalized nightlife mobile application that curates entertainment options based on the user's preferences and interests.

Including a business section where we allow businesses to promote their businesses and events within the app to their target clientele.



Research Problem

The growing reliance on social media platforms and virtual interactions has led to a neglect of physical meetups and gatherings, resulting in feelings of isolation and loneliness among individuals, particularly those who have relocated to unfamiliar environments.

This phenomenon has significant implications for mental health, including stress, depression, and related issues.

Furthermore, existing market applications that promote businesses often fail to adequately address this problem, contributing to business failures due to investments made without proper statistical data.

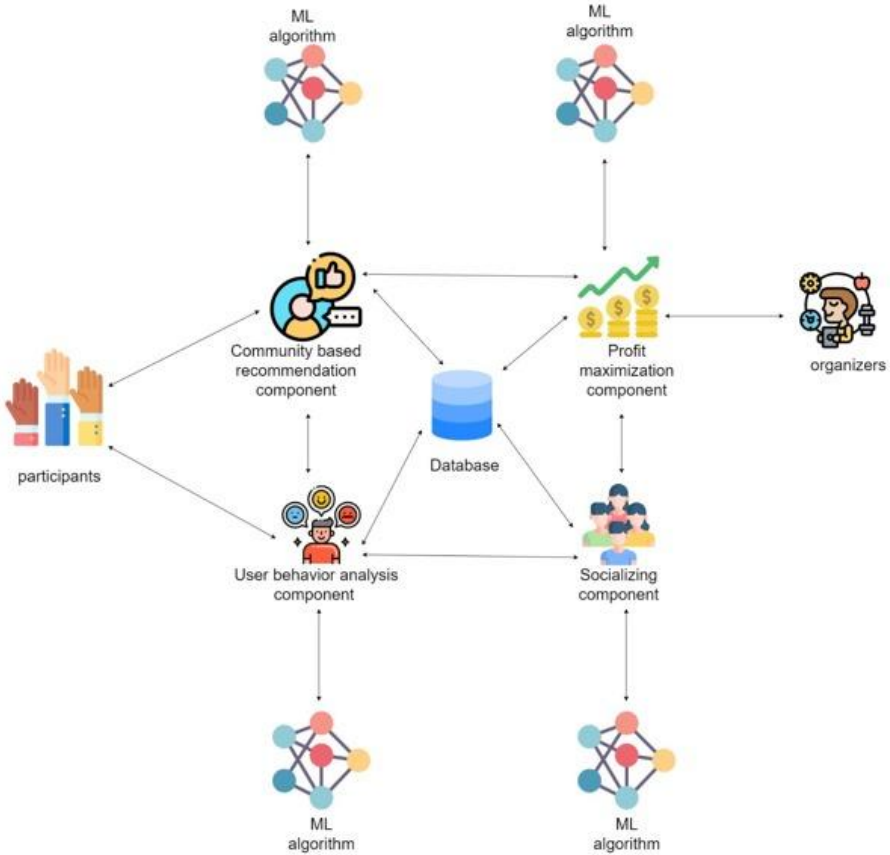
Main Objective

Design and implement a personalized nightlife application that aims to alleviate social isolation and loneliness among individuals, particularly those new to unfamiliar environments, while simultaneously providing valuable data analytics tools for businesses.

Sub-Objectives

1. User Behaviour Analysis
2. Community Based Recommendations
3. Socialization Process
4. Profit Maximization & Analytics

System Overview Diagram



Commercialization

Logo

A Night Owl cause “Night-Out”

Haha... get it? “Night Out? Owl?

No?

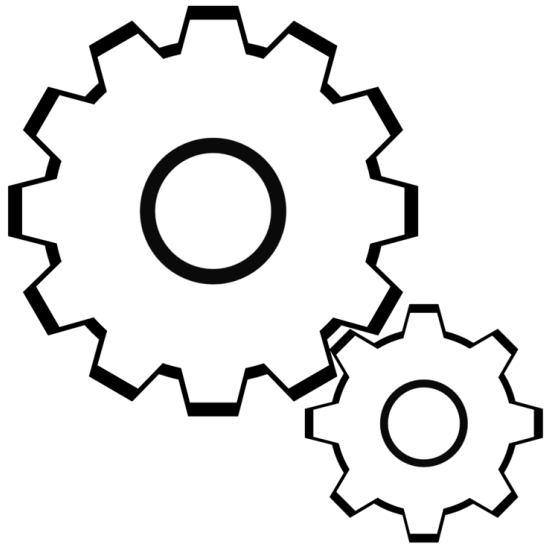
Nevermind.

Commercialization Plan

- Define and understand the target audience
  - Identify ideal users.
- University Promotion
  - Introduce it to local universities and allow students to test it out
- Promote on various forms of social media.
- Data Monetization Services. (Analytics & insights)
- Introduce a freemium and premium model
- In-app advertising revenue.

Individual Components

1. User Behaviour Analysis - Neal Akmeemana
2. Community Based Recommendations - Tehan Sirisinghe
3. Socialization Process - Naween Dharmapala
4. Profit Maximization - Pasindu Samarasinghe



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User Behaviour Analysis

Research Problem

Methodology

Demonstration

Research Problem

Not having established applications with a well functioning event recommendation system that incorporates machine learning algorithms for user behaviour analysis.

Specific Objective

Develop a user behaviour analysis component using machine learning algorithms which will personalize recommendations according to each and every individual user depending on their personal preferences.

Methodology

- Data Collection
- Data Preprocessing
- Model Training
- Tuning Datasets
- Similarity Calculation
- Comparing Algorithms
- Selecting Algorithm With Highest Score
- Testing
- Evaluation
- Fine-Tuning

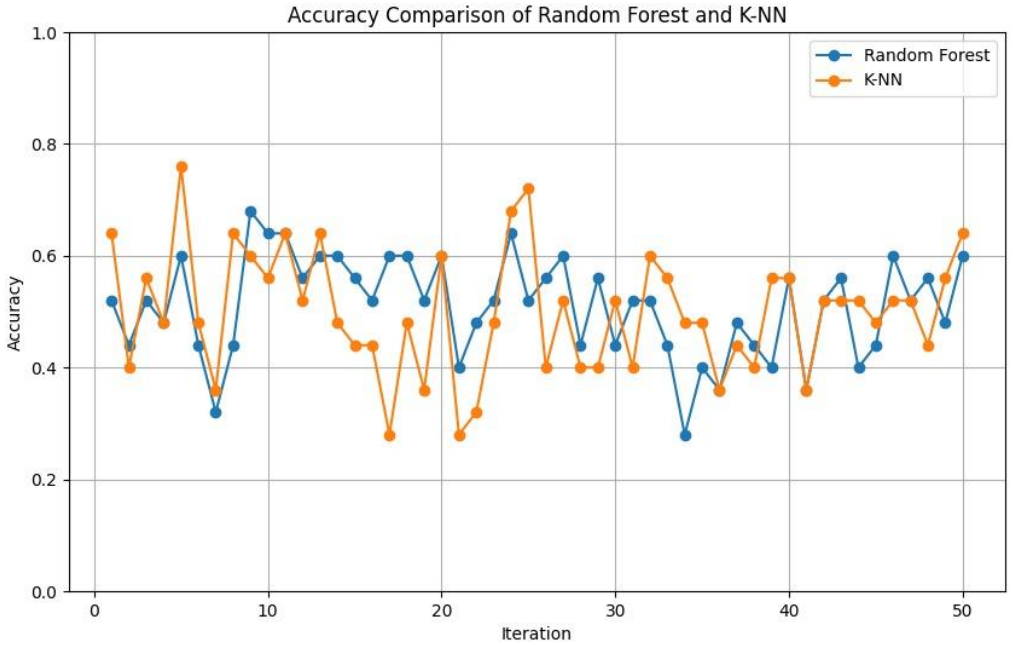
Technology Stack

- Java
- Python
- Firebase
- Firebase Authentication

Analytics and Reporting:

- Python: For data analysis and machine learning (if needed).
- Pandas: A Python library for data manipulation and analysis.
- Matplotlib and Seaborn: For data visualization.
- Jupyter Notebook: For interactive data analysis.

Algorithm Comparison



Achievement

Provide users with accurate recommendations according to their likes and preferences.

The more accurate the more successful.

References (Mandatory)

1.OmniConvert. (n.d.). Customer Behavior Analysis: What It Is and How to Do It. Retrieved from https://www.omniconvert.com/blog/customer-behavior-analysis/

2.SCUBA. (n.d.). How to Conduct a Behavioral Analysis. Retrieved from https://www.scuba.io/blog/how-to-conduct-a-behavioralanalysis#:~:text=What%20is%20a%20customer%20behavioral,motives%20and%20influences%2 0behind%20them

3.Anwar, S., Rizwan, M., & Malik, K. (2022). A Hybrid Approach for Predicting Customer Behavior Analysis Using Deep Learning Techniques. Journal of Financial Studies, 2022, 4938278. Retrieved from https://www.hindawi.com/journals/jfs/2022/4938278/

4.Section Engineering Education. (n.d.). Applying AI and ML to Predict Consumer Behavior. Retrieved from https://www.section.io/engineering-education/applying-ai-and-ml-to-predictconsumer-behavior/

5.Liu, L., Gao, J., Yang, Z., & Wang, Y. (2020). User behavior analysis in social media using machine learning techniques: A systematic literature review. IEEE Access, 8, 12524-12536. [Link](https://doi.org/10.1109/ACCESS.2020.2964231)

6.Thakur, A., Mittal, N., & Sharma, N. (2021). Machine learning-based user behavior analysis for personalized services: A survey. IEEE Transactions on Systems, Man, and Cybernetics: Systems, 51(3), 1549-1565. [Link](https://doi.org/10.1109/TSMC.2019.2960964)

7.Wu, L., Chen, H., & Xiong, N. N. (2020). User behavior analysis in Internet of Things using machine learning: A survey. ACM Computing Surveys, 53(1), Article 17. [Link](https://doi.org/10.1145/3380990)

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Community Based Recommendation

Research Problem

Methodology

Demonstration

Research Problem

1.How can the accuracy and relevance of community-based recommendation systems be improved?

2.What impact do different recommendation algorithms (collaborative filtering, content-based filtering, hybrid filtering) have on the performance of community-based recommendation systems?

3.What are the most effective evaluation metrics for measuring the performance of community-based recommendation systems?

4.How do user engagement and feedback impact the success of community-based recommendation systems?

5.What are the most effective evaluation metrics for measuring the performance of community-based recommendation systems?

Specific Objective

•Main object : The primary objectives of the component are to enhance users' social connections by categorizing them based on shared interests, suggesting posts according to community interests, filtering posts by verified users, and ultimately rendering the system more enticing to users. Additionally, the component aims to render unfamiliar surroundings more familiar to users while maintaining their psychological well-being.

Sub objectives :

Implementing a mobile application as an entertainment platform.

Building a model for recommending most suitable event using an algorithm.

Building a model for recommending most suitable community for a user by using an algorithm. Identify what user preferences are.

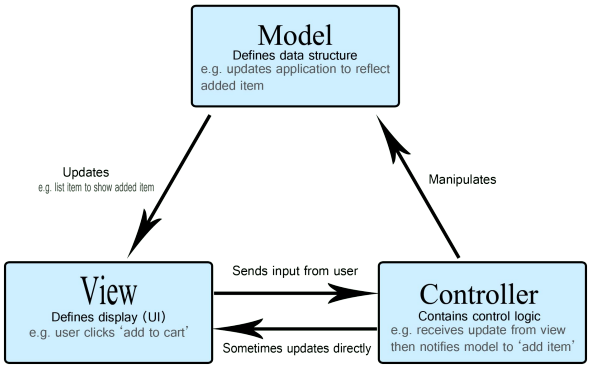
Methodology

Algorithm to be used: Hybrid Recommendation algorithm which uses both collaborative and content-based filtering algorithm.

- Step 1: Define the research question and gather the data
- Step 2: Check for outliers and normality
- Step 3: Determine the data and features
- Step 4: Select correct algorithms to be used in hybrid recommendation.
- Step 5: Determine the weights to each algorithm.
- Step 6: Generate recommendations.

Technology Stack

- Python
- Java
- FireBase



Analytics and Reporting:

- Python: For data analysis and machine learning (if needed).
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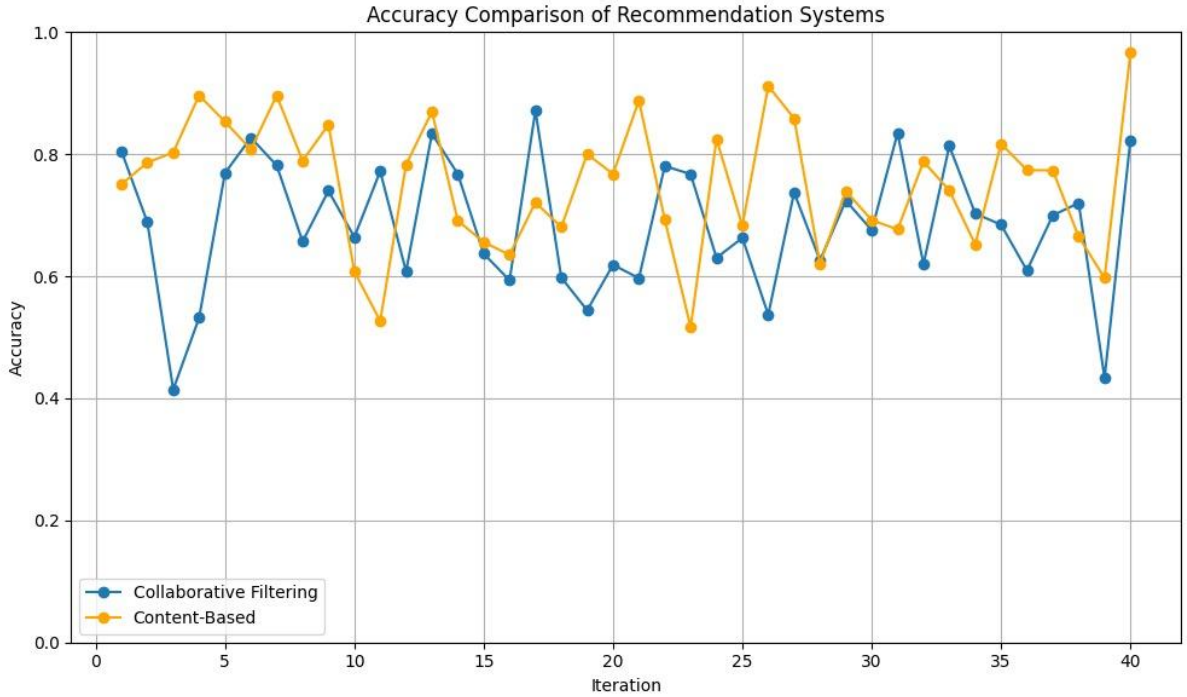
- Jupyter Notebook: For interactive data analysis.

Algorithm Comparison



Achievement

The community-based recommendation system employs content-based and collaborative filtering techniques to enhance user connections and event recommendations. It identifies and categorizes users into communities, combining individual preferences with community wisdom. Achievements encompass fostering user interaction, reducing social isolation, and delivering highly tailored event suggestions that align with users' interests.

References (Mandatory)

1."Online Entertainment Platforms": https://theenterpriseworld.com/facts-about-onlineentertainment-platforms/. 20

2."The rise of social media," in Sport, Racism and social media, Routledge, 2017, pp 13-24.

3."Most popular social networks worldwide": https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-ofusers/. [Accessed: 21-Jan-202

4.Alexander Felfernig, Michael Jeran, Gerald Ninaus, Florian Reinfrank & Stefan Reiterer, "Toward the Next Generation of Recommender Systems: Applications and Research Challenges", Multimedia Services in Intelligent Environments pp 81–98,https://link.springer.com/chapter/10.1007/978-3-319-00372-6_5

5.Hannah Tow, "108 Shocking Event Industry Statistics You Need to Know", https://www.a2.com/articles/event-industry-statistics#planning

6.Kifayat Ullah Khan a, Batjargal Dolgorsuren a, Tu Nguyen Anh a, Waqas Nawaz a b, Young-Koo Lee a, "Faster compression methods for a weighted graph using locality sensitive hashing", Information Sciences [pp 237-253], https://www.sciencedirect.com/science/article/abs/pii/S0020025516316085?via%3Dihub

7.U. Yeliz Eseryel, "Decision-making Processes in Community-based Free/Libre Open Source Software-development Teams with Internal Governance", https://www.researchgate.net/publication/340722857_Decisionmaking_Processes_in_Community-based_FreeLibre_Open_Source_Softwaredevelopment_Teams_with_Internal_Governance_An_Extension_to_Decisionmaking_Theory , Communications of the Association for Information Systems [DOI:10.17705/1CAIS.04620], Jan-2020

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Socialization Process And Rating System

Research Problem

Methodology

Demonstration

Research Problem

1.How does the use of verified users in a rating system affect user trust and engagement with events?

2.How effective is the personalized recommendation system in increasing user satisfaction and attendance to events?

3.What is the impact of socialization components on user engagement and satisfaction?

4.How can machine learning algorithms improve the accuracy and trustworthiness of the rating system and personalized recommendations?

Specific Objective

Implementing an artificial intelligence-based algorithms to overcome the problems associated with traditional user evaluation and rating systems.

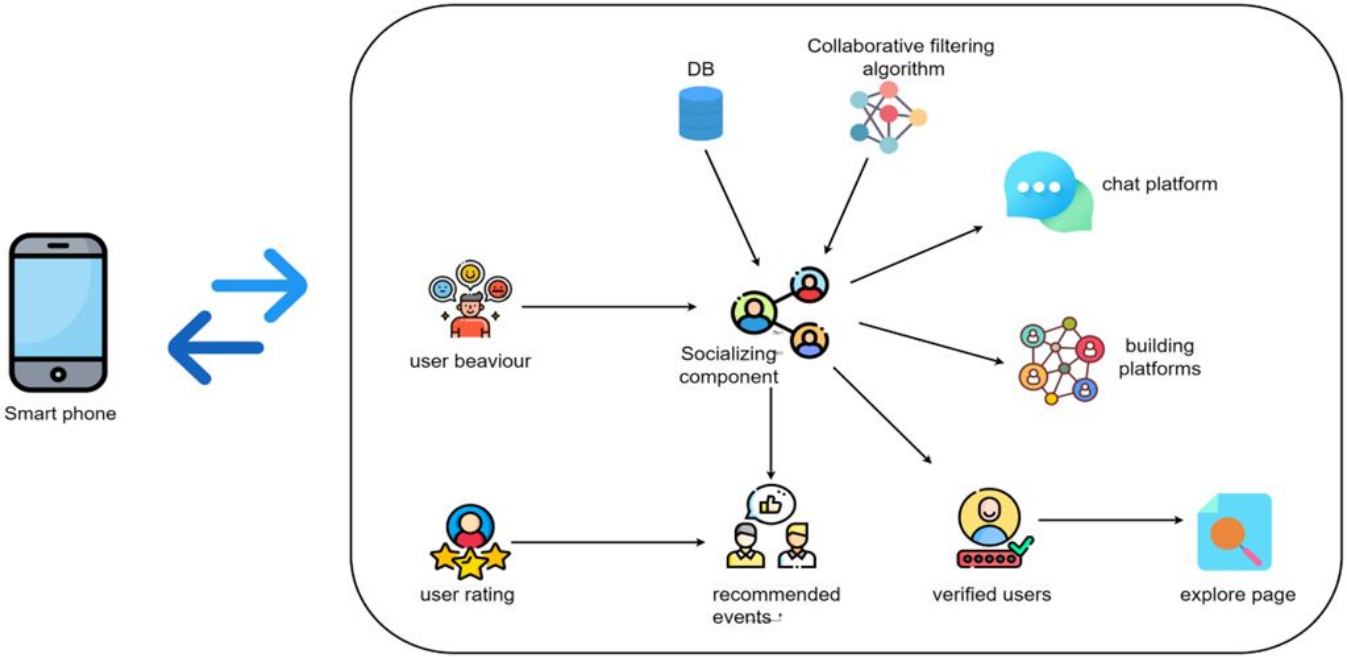
Sub-objectives

1.Implementing a mobile-based application as a hybrid social media and event management platform.

2.Building a model for recommending events based on the preferences for a chosen user using an algorithm.

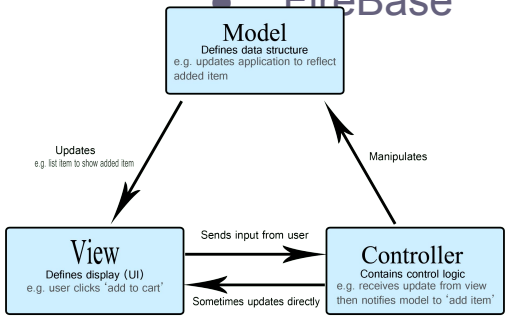
3.Identifying trustworthy feedbacks from users.

Methodology



Technology Stack

- Python
- Java
- FireBase



Analytics and Reporting:

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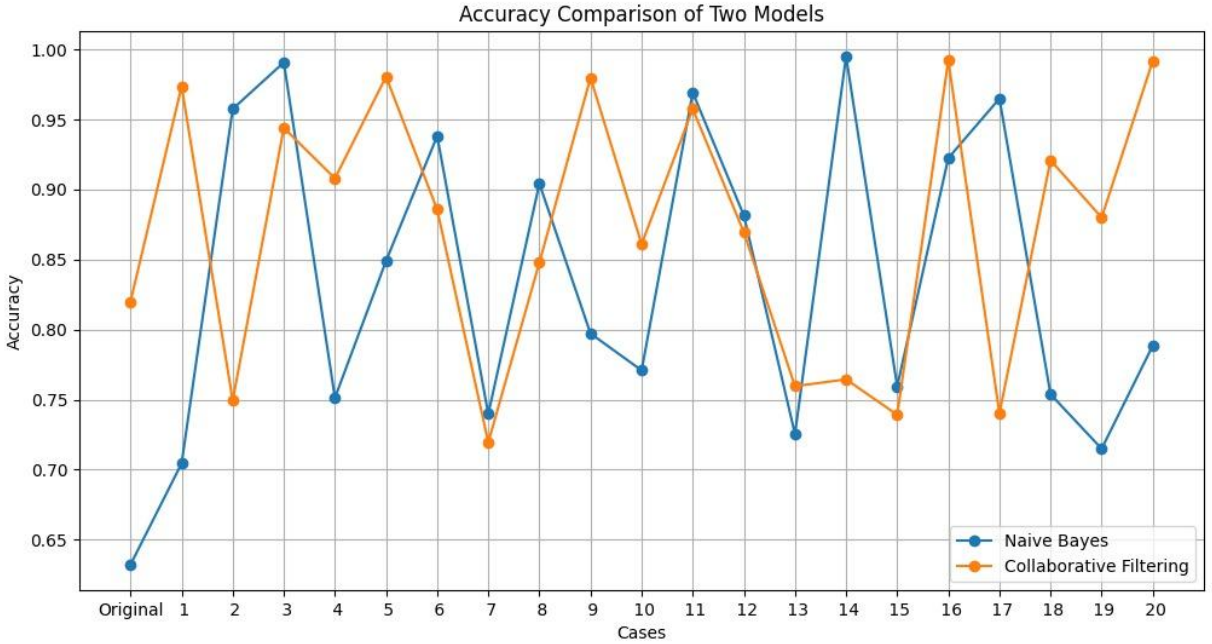
Algorithm Comparison



References

https://www.convinceandconvert.com/digital-marketing/influencer-marketing-for-businesses/

https://degree.lamar.edu/online-programs/undergraduate/bba/marketing/influencers-are-a-growing-marketing-strategy/

https://zesium.com/case-studies/afterparty/

https://www.mdpi.com/2071-1050/11/4/1210

https://www.sciencedirect.com/science/article/pii/S0019850122002097

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8872418/

https://themindstudios.com/blog/how-to-make-event-app-for-nightclubs/

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Profit Maximization

Research Problem

Methodology

Demonstration

Research Problem

1.How can businesses use data analysis to identify areas where they can reduce costs and increase profitability?

2.How do changes in the economic and market conditions affect a business's profitability and what can businesses do to mitigate these effects?

3.How can businesses use marketing and promotional strategies to increase their sales and revenue?

4.How can businesses effectively manage their cash flow to maximize profitability and ensure long-term success?

5.What impact do pricing strategies have on a business's profitability and how can businesses optimize their pricing strategies?

Specific Objective

Creating a framework that uses machine learning and other AI approaches to improve crucial factors, including as pricing, inventory control, and marketing tactics, that have a significant influence on profitability

Sub-objectives

1.Implementing a mobile-based application as a hybrid social media and event management platform.

2.Predicting attendance.

3.Optimize pricing

4.Personalized recommendations

5.Optimize marketing spend

6.Identify opportunities for cross-selling and upselling

Methodology

Step 1: Define the research question and gather the data

Step 2: Check for outliers and normality

Step 3: Conduct exploratory data analysis

Step 4: Select the independent variables

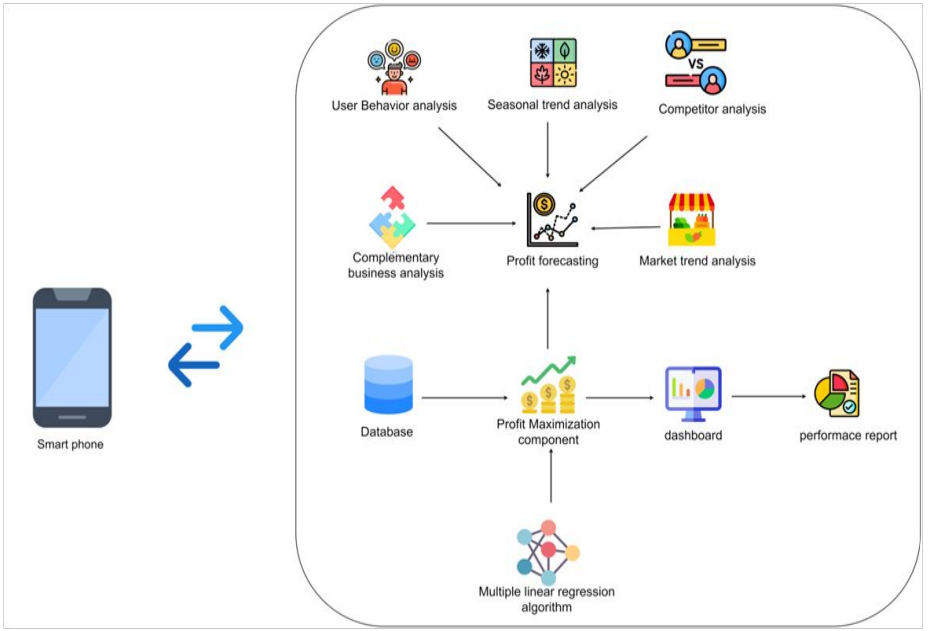
Step 5: Encode categorical variables

Step 6: Fit the multiple linear regression model

Step 7: Check for statistical significance

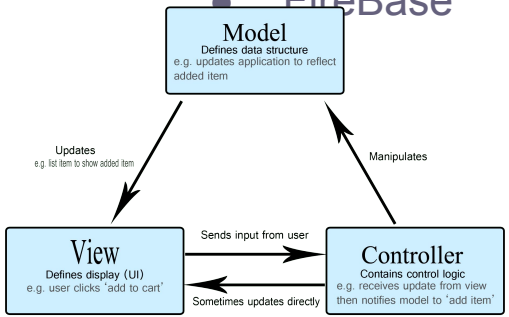
Step 8: Check for model fit

Step 9: Interpret the results



Technology Stack

- Python
- Java
- FireBase



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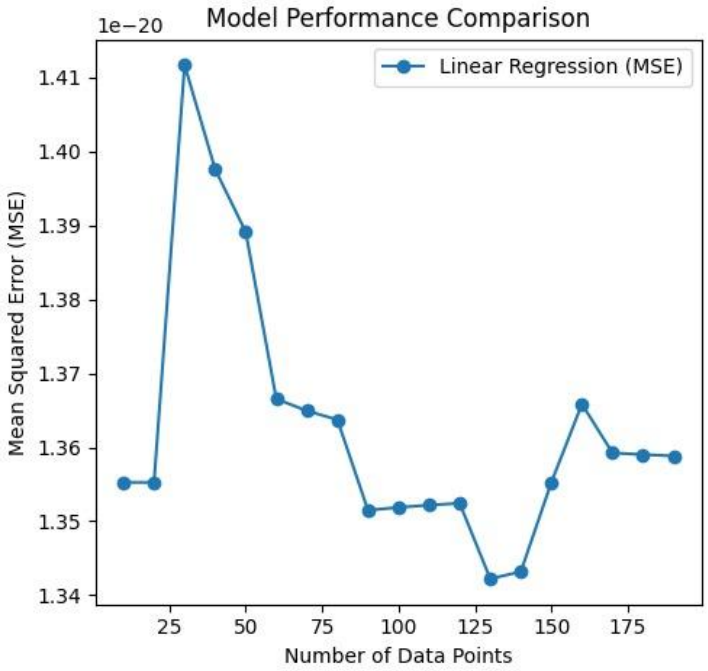
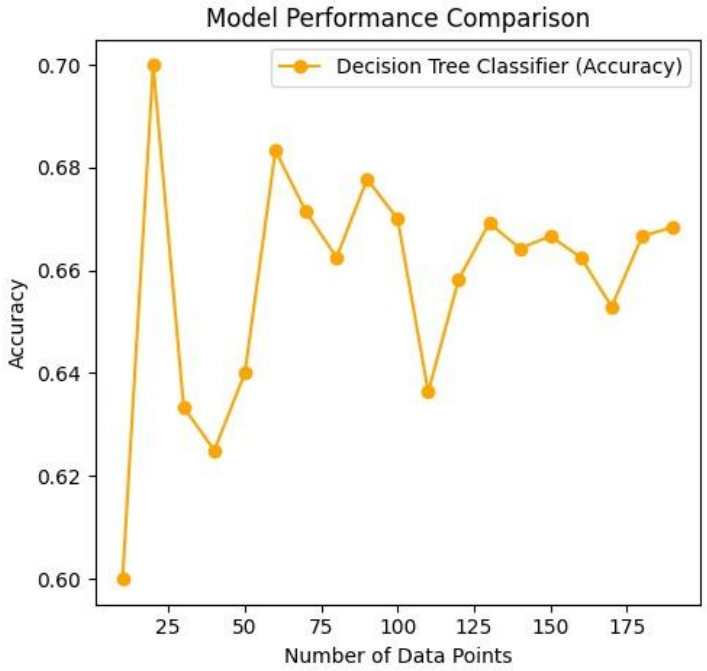
Algorithm Comparison





Achievement

- This component employs decision tree and multiple linear regression algorithms to optimize profit generation. It collects and preprocesses data, develops predictive models, and evaluates their performance. Achievements include aiding businesses in making data-driven decisions, improving revenue streams, and ensuring continuous model improvement through monitoring and feedback loops

References (Mandatory)

1.Haghpanah, S. (2018). Profit Maximization in Business Using Artificial Intelligence. International Journal of Research and Scientific Innovation, 5(10), 1-9. https://www.rsisinternational.org/journals/ijrsi/vol-5-issue-10-2018/1-9.pdf

2.Velmurugan, G., & Parthiban, P. (2021). A study on the application of artificial intelligence in profit maximization. Computational and Theoretical Nanoscience Journal, 18(5), 2995- 2998. https://www.ingentaconnect.com/content/asp/jctn/2021/00000018/00000005/art0000

3.McKinsey & Company. (2021). AI for supply-chain optimization. https://www.mckinsey.com/business-functions/operations/our-insights/ai-for-supplychain-optimization

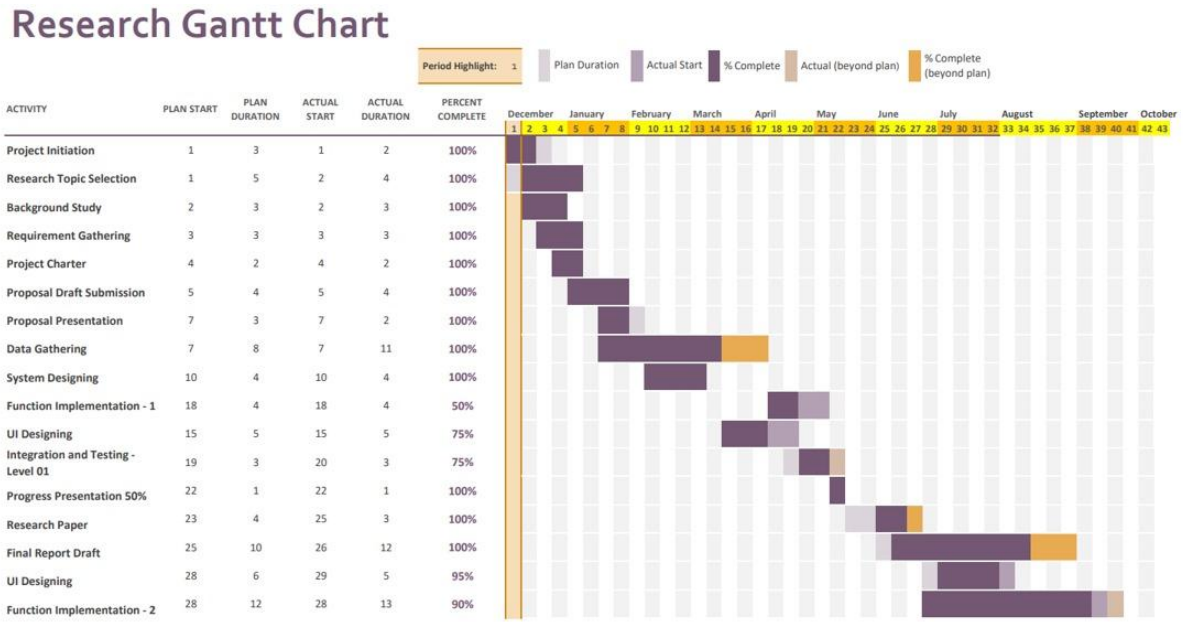
4.Lu, L., Zeng, Y., & Li, J. (2019). An AI-Driven Profit Maximization Strategy in E-commerce. 2019 14th International Conference on Computer Science & Education Proceedings (ICCSE) (pp. 1029-1032). IEEE. https://ieeexplore.ieee.org/abstract/document/9042708

5.Fanta, F. A. (2020). Artificial Intelligence and Its Impacts on Business Profit Maximization. Journal of Economic Development and Information Technology, 11(2), 23-37. https://www.jited.org/index.php/jited/article/view/596/0

6.Harvard Business Review. (2018). How AI is changing business models. https://hbr.org/2018/07/how-ai-is-changing-business-models

7.Forbes. (2021). AI-powered customer experiences can drive profit for businesses. https://www.forbes.com/sites/cognitiveworld/2021/08/31/ai-powered-customerexperiences-can-drive-profit-for-businesses/?sh=4a4d7eb928b5

Gantt Chart



ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE
Project Initiation	1	3	1	2	100%
Research Topic Selection	1	5	2	4	100%
Background Study	2	3	2	3	100%
Requirement Gathering	3	3	3	3	100%
Project Charter	4	2	4	2	100%
Proposal Draft Submission	5	4	5	4	100%
Proposal Presentation	7	3	7	2	100%
Data Gathering	7	8	7	11	100%
System Designing	10	4	10	4	100%
Function Implementation - 1	18	4	18	4	50%
UI Designing	15	5	15	5	75%
Integration and Testing - Level 01	19	3	20	3	75%
Progress Presentation 50%	22	1	22	1	100%
Research Paper	23	4	25	3	100%
Final Report Draft	25	10	26	12	100%
UI Designing	28	6	29	5	95%
Function Implementation - 2	28	12	28	13	90%

Mobile App Demonstration

Thank You!

Q&A