

Optimizing Facebook's Product Strategy: Using Data Analysis with Python, SQL, and Tableau for Optimal 4Ps Marketing Mix Placement

Data Analysis



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About Me:

Hello! I'm Jewel Alam, and I have a wide academic background, including a bachelor's and master's degree in pharmacy. However, my passion is in the field of data analysis. This interest encouraged me to make a bold decision in my last year. I started my journey by watching free lectures on YouTube, where I gained a basic understanding of data analytics. Eager to broaden my expertise, I enrolled in several lengthy bootcamps on Udemy, focused on Business Intelligence Analysis. The courses equipped me with the knowledge and confidence required to take on real-world projects.

Over time, I've completed a few projects using tools and technologies such as **Python, MySQL, Tableau, Statistics and Excel**. Every project has served as an opportunity for me to develop my skill set and gain a better understanding of data analytics.

My long-term objective is strong and clear: to become one of the world's top analysts. I'm primarily interested in analysis for app development, web development, and software product development. These sectors not only match my skills, but also excite me because of their potential to innovate and revolutionize industry.

Thank you for taking the time to discover more about me. I am excited to bring my experience and passion for data analytics to relevant and impactful projects.

Warm Regards

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Contents:

1. Introduction
2. Project Objective
 - 2.1. Data collection and Preprocessing with Python
 - 2.2. Data Analysis with SQL
 - 2.3 Visualization and Dashboard creation with Tableau
 - 2.4 Feature identification and App Optimization
 - 2.5 Market Placement Using The 4Ps Marketing Mix
3. Results
 - 3.1. Data preprocessing using python
 - 3.2. Important insights of MySQL workbench results
4. Discussion
5. Facebook optimization
6. Conclusion

1. Introduction:

In today's digital era, social media platforms such as Facebook have become an integral part of our daily lives. To maintain its competitive edge, Facebook must constantly optimize its product strategy. This project, "Optimizing Facebook's Product Strategy: Using Data Analysis with Python, SQL, and Tableau for Optimal 4Ps Marketing Mix Placement," takes use of state-of-the-art Business Intelligence analysis technologies to enhance Facebook's app performance and strategically deploy its best version in the market.

2. Project Overview

The project is divided into many important phases, each of which employs tools and methods to achieve the desired outcomes:

2.1 Data Collection and Preprocessing with Python:

- **Objective:** To gather and prepare a substantial dataset of user reviews for analysis.
- **Method:** Using Python's pandas' library, we processed nearly 80,000 user reviews of various Facebook versions. This involved cleaning the data, handling missing values, and structuring it for further analysis. This preprocessing step ensures that the data is reliable and ready for insightful analysis.

2.2 Data Analysis with SQL:

- **Objective:** To identify the best-rated version of Facebook based on user reviews.
- **Method:** SQL was employed to query the processed data, enabling us to perform detailed analysis and extract key insights. We focused on determining which version of Facebook received the highest ratings from users, considering various metrics such as overall rating, feature-specific ratings, and user feedback trends. This step was crucial for pinpointing the version that resonated most with users.

2.3 Visualization and Dashboard creation with Tableau:

- **Objective:** To visualize the analysis results and provide a dynamic, interactive platform for stakeholders.

- **Method:** Tableau was utilized to create a live dashboard that displays the analysis results in an accessible and visually appealing manner. The dashboard allows users to interact with the data, exploring different aspects of the analysis to gain a comprehensive understanding of the findings. This visualization helps in communicating the results effectively to stakeholders.

2.4 Feature Identification and App Optimization:

- **Objective:** To identify the key features of the best-rated Facebook version and optimize the app for enhanced performance.
- **Method:** By analyzing the user feedback and ratings, we identified the features that contributed to the best version's high ratings. These insights guided us in making recommendations for app improvements, focusing on enhancing user experience and addressing any issues highlighted by users. This phase aims to ensure that the app continues to meet and exceed user expectations.

2.5 Market Placement Using the 4Ps Marketing Mix:

- **Objective:** To strategically place the optimized Facebook app in the market using the 4Ps (Product, Price, Place, Promotion) of marketing.
- **Method:** We applied the 4Ps marketing model to position the final product effectively in the market. This involved:
 - **Product:** Ensuring the app's features align with user preferences and needs.
 - **Price:** Setting a pricing strategy that reflects the app's value and competitive positioning.
 - **Place:** Determining the best channels for app distribution to reach the target audience.
 - **Promotion:** Developing marketing campaigns to highlight the app's key features and attract new users.

3.Results

3.1 Data preprocessing using python:

- I have downloaded a customer review dataset of Facebook from Kaggle.
- It contains 76,779 records and 8 fields.

First, I have removed the following fields using the Pandas library:

As part of the data cleaning process, these fields contain categorical values.

- reviewId
- userName
- content
- reviewCreatedVersion

Jupyter Facebook_by_Jewel_Alam Last Checkpoint: 06/02/2024 (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Not Trusted Python 3

Run Code

Out [6]:

	reviewId	userName	content	score	thumbsUpCount	reviewCreatedVersion	at	appVersion
0	becc4280-7002-46e6-9b70-4c3b8645c829	Dawn K (Lost in Orange)	The whole AI feature for search is ridiculous....	3	629	464.0.0.60.90	2024-05-22 21:21:54	464.0.0.60.90
1	609939a8-dc9a-42f9-ac22-b665b371dfec	Fahim Hossain Farhan	The app works very well	5	0	464.0.0.60.90	2024-05-22 21:18:58	464.0.0.60.90
2	4f28a5b8-cbcc-406a-bdc9-01ec268a00df	kalpana singh	Ati uttam	5	0	464.0.0.60.90	2024-05-22 21:18:15	464.0.0.60.90
3	0f105f91-0c7f-4c60-9359-bf3e14fedaa3	Vhemmie Ziganay	Good	5	0	464.0.0.60.90	2024-05-22 21:16:48	464.0.0.60.90
4	76c06cec-dd81-495d-a5f2-bc1736a4ec76	Gary Barton	Gary Barton Spencerport New York Jeff is the b...	5	0	464.0.0.60.90	2024-05-22 21:16:18	464.0.0.60.90
...
76774	d7816c49-b04a-4069-b9f9-25e63d069a41	Deepak thakur	nice video	5	0	NaN	2024-05-08 00:07:55	NaN
76775	c23d2b31-4c97-41de-867c-3f5ef3a61d0d	Joseph Leblanc	love it!!!	5	0	462.0.0.47.85	2024-05-08 00:07:38	462.0.0.47.85
76776	01bdb728-5042-4a8f-b207-8a02263c7b3e	Christian Kelechi	Good work is confirmed	5	0	361.0.0.39.115	2024-05-08 00:07:31	361.0.0.39.115
76777	a5207278-bc25-4bbb-b999-004407519b81	Mankhush Abinash	I NH by t um TV ex RV hu by	1	0	462.0.0.47.85	2024-05-08 00:04:41	462.0.0.47.85
76778	60cb051b-de1e-4081-970b-6b7cd7e3dc03	Trudy Musgrove	Works	3	0	NaN	2024-05-08 00:01:21	NaN

76779 rows x 8 columns

In [7]: checkpoint_1.head(1)

Out [7]:

	reviewId	userName	content	score	thumbsUpCount	reviewCreatedVersion	at	appVersion
0	becc4280-7002-46e6-9b70-4c3b8645c829	Dawn K (Lost in Orange)	The whole AI feature for search is ridiculous....	3	629	464.0.0.60.90	2024-05-22 21:21:54	464.0.0.60.90

Figure 1. The original dataset before preprocessing.

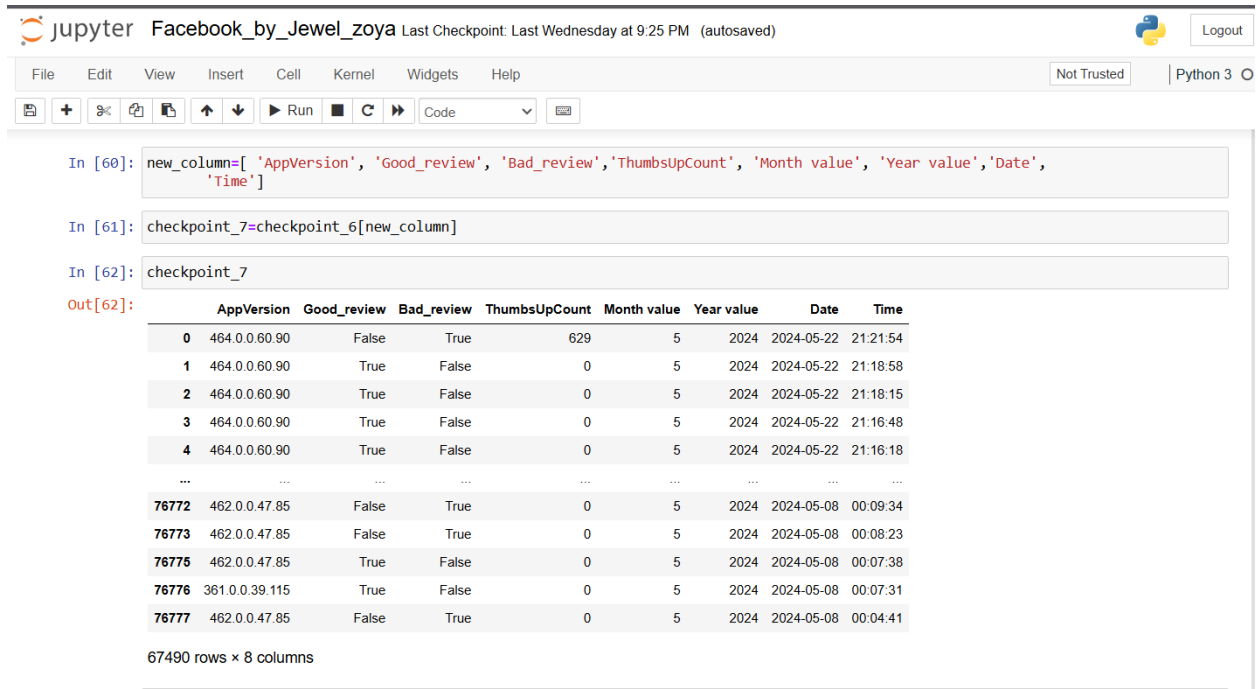


Figure: 2 The dataset after the data preprocessing using python

3.2 Important insights of MySQL workbench results:

3.2.1Insight: Insight regarding overall sentimental analysis

	A	B	C	D	E
1	GoodReviews	BadReviews			
2	36686	30804			
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					

Figure 3. The total good reviews and the total bad reviews for all the versions of Facebook

3.2.2 Insight: version performance analysis

- I have shortlisted the app versions that have at least 500 good reviews.
- There are 11 Facebook versions that have more than 500 good reviews.
- Although there are many bad reviews along with good ones.
- The 11 Facebook versions also have the total thumbs-up counts.
- Apps that received 4 and 5-star ratings fall under good, reviewed apps.
- Apps that received 1, 2, and 3-star ratings fall under bad reviewed apps.

	A	B	C	D	E	F
1	AppVersion	GoodReviews	BadReviews	TotalThumbsUp		
2	463.1.0.53.85	9172	3292	137895		
3	462.0.0.47.85	7121	2599	81255		
4	464.0.0.60.90	4631	1776	57338		
5	461.0.0.47.85	2249	1267	49373		
6	463.0.0.45.85	1883	672	4818		
7	460.0.0.34.89	1878	1830	217420		
8	459.1.0.42.84	1013	1540	47136		
9	458.0.0.38.86	909	841	52262		
10	436.0.0.35.101	874	348	12885		
11	453.0.0.40.107	666	2933	200901		
12						
13						
14						
15						
16						
17						
18						

Figure 4. top 11 app version that got maximum good reviews on the play store

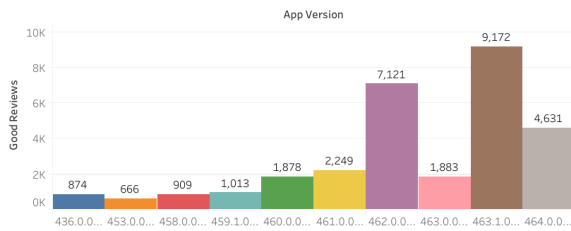
4. Discussion:

All the data of the top 11 most liked versions are visualized using the tableau live dashboard

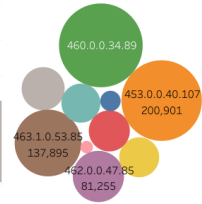
Here we can select the best app and identify features to be optimized.

- From the above dashboard, we can see that Facebook version 463.1.0.53.85 received the top rating.
 - A total of 9,172 people gave a good rating to this app version.
 - Therefore, we can retain the features of this version.
- Facebook version 460.0.0.34.89, followed by 453.0.0.40.107, have the maximum thumbs-up counts among the top-rated Facebook versions.
 - We can analyze the extra features of these app versions.
 - The features from these versions can be added to Facebook version 463.1.0.53.85 to enhance it further.

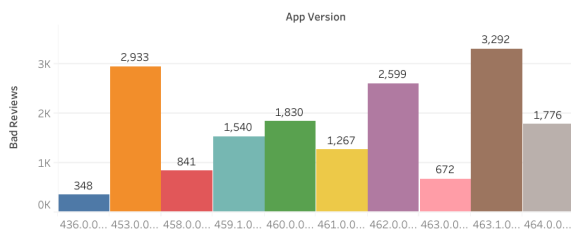
Facebook Version vs good review



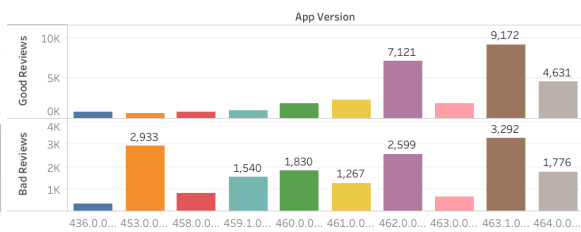
Facebook Version vs Total thumbs Up Count



Facebook version vs bad review



Facebook version vs Good review and Bad review



App Version	
436.0.0.35.101	✓
453.0.0.40.107	✓
458.0.0.38.86	✓
459.1.0.42.84	✓
460.0.0.34.89	✓
461.0.0.47.85	✓
462.0.0.47.85	✓
463.0.0.45.85	✓
463.1.0.53.85	✓
464.0.0.60.90	✓

Facebook version 463.1.0.53.85, released in May 2024, includes several notable updates and features aimed at improving user experience and functionality. Key features and enhancements of this version include:

- **Performance Improvements:** This version has been optimized for better performance, ensuring smoother navigation and quicker load times for various features.
- **Enhanced Privacy Settings:** Improved privacy controls allow users to manage their data and permissions more effectively, providing greater control over who can see their content and personal information.
- **Bug Fixes and Stability:** The update addresses several bugs from previous versions, enhancing overall app stability and reducing crashes and glitches.
- **UI Enhancements:** Minor tweaks and improvements to the user interface make it more intuitive and user-friendly, providing a more seamless experience.
- **Compatibility:** The app supports a wide range of devices and resolutions, ensuring optimal performance across different Android versions and device specifications.

These updates aim to enhance both the security and usability of the app, making it more reliable and enjoyable for its users.

Facebook version 460.0.0.34.89, released in April 2024, includes several updates and unique features aimed at improving user experience and functionality:

- Enhanced Privacy Settings: This version includes more detailed privacy controls, allowing users to better manage who can see their posts and profile information.
- Improved Performance: The app has been optimized for better performance on various devices, particularly focusing on smoother operation on older Android versions (8.0+) and different screen DPIs.
- Bug Fixes and Stability Improvements: Numerous bug fixes have been implemented to enhance overall app stability and reduce crashes.
- UI Enhancements: Minor user interface changes have been made to improve navigation and the overall visual appeal of the app.
- New Sharing Options: Expanded options for sharing posts, photos, and videos, making it easier to distribute content across different platforms.
-
- Accessibility Improvements: Features to make the app more accessible to users with disabilities, including better support for screen readers and voice commands.

The Facebook app version 453.0.0.40.107, released around February and March 2024, includes several notable features and improvements:

- Performance Enhancements: This version focuses on improving the overall performance and stability of the app. Users should notice faster load times and smoother navigation throughout the app.
- Bug Fixes: Various bug fixes are included in this update, addressing issues that were present in previous versions. These fixes aim to provide a more reliable user experience.
- Optimized for Multiple Device Specifications: The app supports a wide range of Android versions and device specifications, including Android 8.0+ (Oreo) and higher, with specific optimizations for different device architectures like armeabi-v7a and arm64-v8a. This ensures that users on various devices can enjoy a consistent experience.
- UI Tweaks: Minor user interface adjustments have been made to improve the visual appeal and usability of the app. These changes are part of Facebook's ongoing efforts to refine the user experience based on user feedback and testing.

- 5. Enhanced Security Features: As part of Facebook's continuous efforts to enhance user security, this version includes updates to security protocols to protect user data and privacy more effectively.

5.Facebook optimization:

After the data analysis, we come in conclusion that we optimized the following features for better user experience and created a new version of facebook:

5.1. Enhance Privacy Settings:

- Detailed privacy controls to better manage who can see posts and profile information.
- Improved controls for managing data and permissions more effectively, providing greater control over content visibility.

5.2. Improved Performance:

- General performance optimizations for smoother operation across various devices.
- Specific improvements for older Android versions (8.0+) and different screen DPIs.
- Faster load times and smoother navigation throughout the app.
- Further optimization, ensuring quicker load times for various features in the latest version.

5.3. Bug Fixes and Stability Improvements:

- Numerous bug fixes to enhance overall app stability and reduce crashes.
- Specific updates addressing issues from previous versions for a more reliable user experience.
- Additional stability improvements in the latest version to reduce crashes and glitches.

5.4. UI Enhancements:

- Minor user interface changes to improve navigation and the overall visual appeal of the app.
- UI tweaks based on user feedback to refine the visual appeal and usability.
- Further tweaks and improvements to make the user interface more intuitive and user-friendly.

5.5. New Sharing Options:

- Expanded options for sharing posts, photos, and videos, making it easier to distribute content across different platforms.

5.6. Accessibility Improvements:

- Features to enhance accessibility for users with disabilities, including better support for screen readers and voice commands.

5.7. Optimized for Multiple Device Specifications:

- Support for a wide range of Android versions and device specifications, including specific optimizations for different device architectures like armeabi-v7a and arm64-v8a.
- Ensured compatibility across a wide range of devices and resolutions, optimizing performance across different Android versions.

5.8. Enhanced Security Features:

- Updates to security protocols to protect user data and privacy more effectively.

6. Conclusion:

To launch this new optimized Facebook version(discussed in the discussion portion) with the consolidated features in India, the marketing strategy should focus on the 4 Ps: Product, Price, Place, and Promotion. Here's a detailed market mix for the new version of Facebook considering its enhanced features:

6.1. Product

Enhanced Features:

- Privacy Controls: Emphasize the detailed privacy settings allowing users to control their data and permissions better, highlighting the ability to manage who sees their posts and profile information.

- Performance Optimizations: Promote improved performance, faster load times, and smoother navigation, especially on older Android versions and devices with different DPIs.
- Bug Fixes and Stability: Highlight the stability improvements and bug fixes that reduce crashes and glitches.
- UI Enhancements: Showcase the minor tweaks and intuitive user interface improvements that make the app more user-friendly.
- New Sharing Options: Market the expanded sharing options that make it easier to share posts, photos, and videos across different platforms.
- Accessibility Features: Stress the enhancements for users with disabilities, including better support for screen readers and voice commands.
- Device Compatibility: Ensure potential users are aware of the app's compatibility across a wide range of devices and resolutions.
- Security Features: Assure users of the enhanced security protocols to protect their data and privacy.

6. 2. Price

- Free Access: Maintain Facebook's model of free access to maximize user adoption and retention.
- Ad-Supported Revenue Model: Continue leveraging the ad-supported revenue model but consider offering new ad formats that are less intrusive yet more engaging.
- Freemium Model (Optional): Introduce premium features or an ad-free experience for a subscription fee to generate additional revenue from users willing to pay for enhanced services.

6.3. Place

Digital Presence:

- App Stores: Ensure the new version is prominently featured on Google Play Store and Apple App Store with updated descriptions and screenshots highlighting the new features.
- Website: Update Facebook's website to promote the new version, detailing the improvements and benefits.

Offline Presence:

- Retail Partnerships: Collaborate with mobile phone retailers to pre-install the new version on devices or offer it as part of setup services.

Regional Adaptation:

- Localization: Ensure the app supports multiple Indian languages to cater to the diverse linguistic landscape of India.
- Regional Content: Curate content and features that resonate with Indian users, such as festival-related themes or region-specific news and entertainment.

6.4. Promotion

Digital Marketing:

- Social Media Campaigns: Leverage Facebook's own platform along with Instagram and WhatsApp to run targeted ad campaigns showcasing the new features.
- Influencer Marketing: Partner with popular Indian influencers and celebrities to create buzz around the new version.
- Content Marketing: Publish blogs, videos, and tutorials that explain the new features and how they enhance user experience.

Traditional Marketing:

- Television and Radio Ads: Use popular TV channels and radio stations to reach a broad audience with compelling ads about the new version's features.
- Print Media: Advertise in leading newspapers and magazines to create awareness among potential users who might not be as active online.

Promotional Offers:

- Referral Programs: Introduce referral incentives where users can earn rewards for getting friends and family to download and use the new version.
- Launch Events: Host virtual and physical events to celebrate the launch, engaging users with demonstrations and interactive sessions.
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Customer Engagement:

- Feedback Loops: Create channels for user feedback to continuously improve the app and address any issues promptly.
- Customer Support: Enhance customer support to assist users in transitioning to the new version and utilizing the new features effectively.