DSS for Social Media Platform for Marketing

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Introduction

- **Social Media: The New Marketing Stage**
  - Platforms are vital for brand storytelling and customer engagement.
  - They reshape brand-consumer interaction, influencing perceptions and purchase decisions.
- **Global Showcase for Brands**
  - Social media offers vast arenas for showcasing products, services, and values.
  - Brands reach a global audience, enhancing visibility and engagement.
- **Powerful Marketing Tools**
  - Businesses leverage sophisticated advertising and audience segmentation.
 - Tailoring increases the likelihood of acquiring new customers.

Scope

- In today's dynamic digital landscape, platform choice is pivotal for marketing success.

- A tailored decision support system is indispensable for effective decision-making.

- Marketers encounter a multitude of choices amidst the rapid expansion of social media platforms.

- Our project aims to streamline this process with clear, data-driven recommendations.

- When it comes to selecting the best social media platform for a brand, it's essential to consider the specific goals and target audience of the business.

- Our DSS aims to aid marketers to select the social media platforms that offer the greatest potential for achieving their marketing objectives and connecting with their target audience effectively.
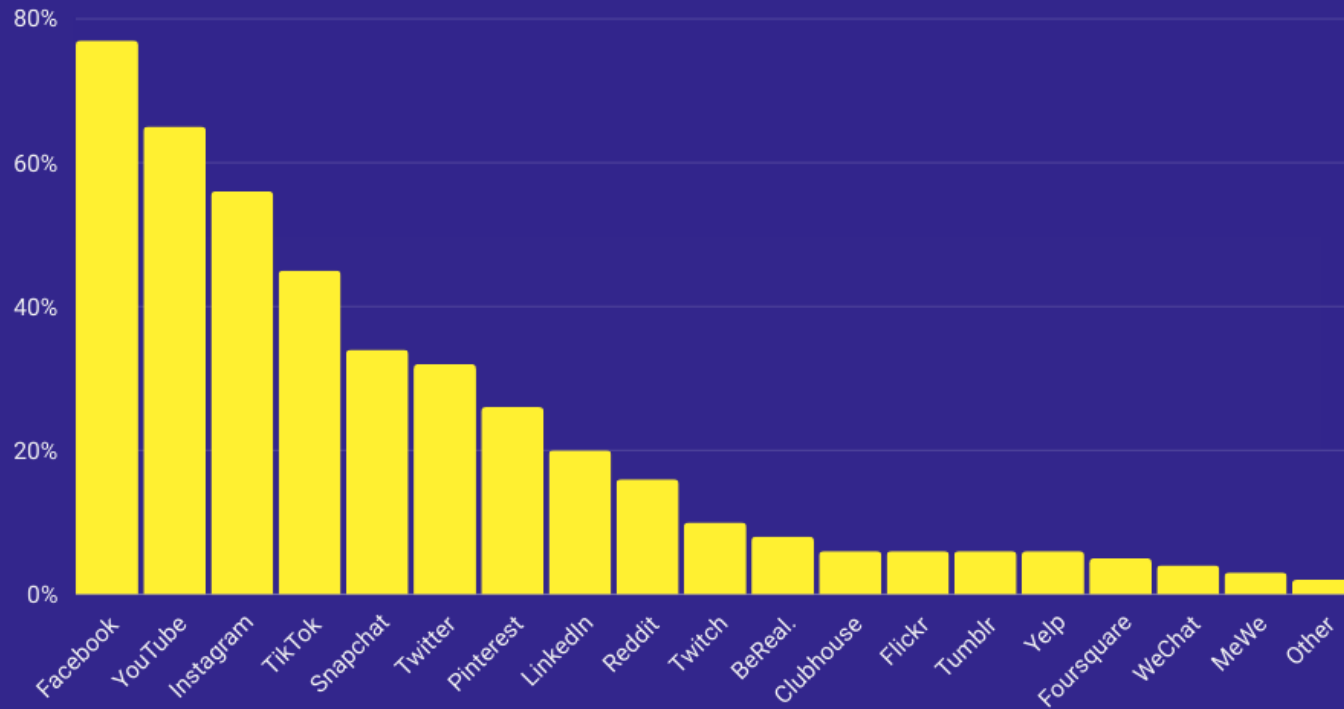
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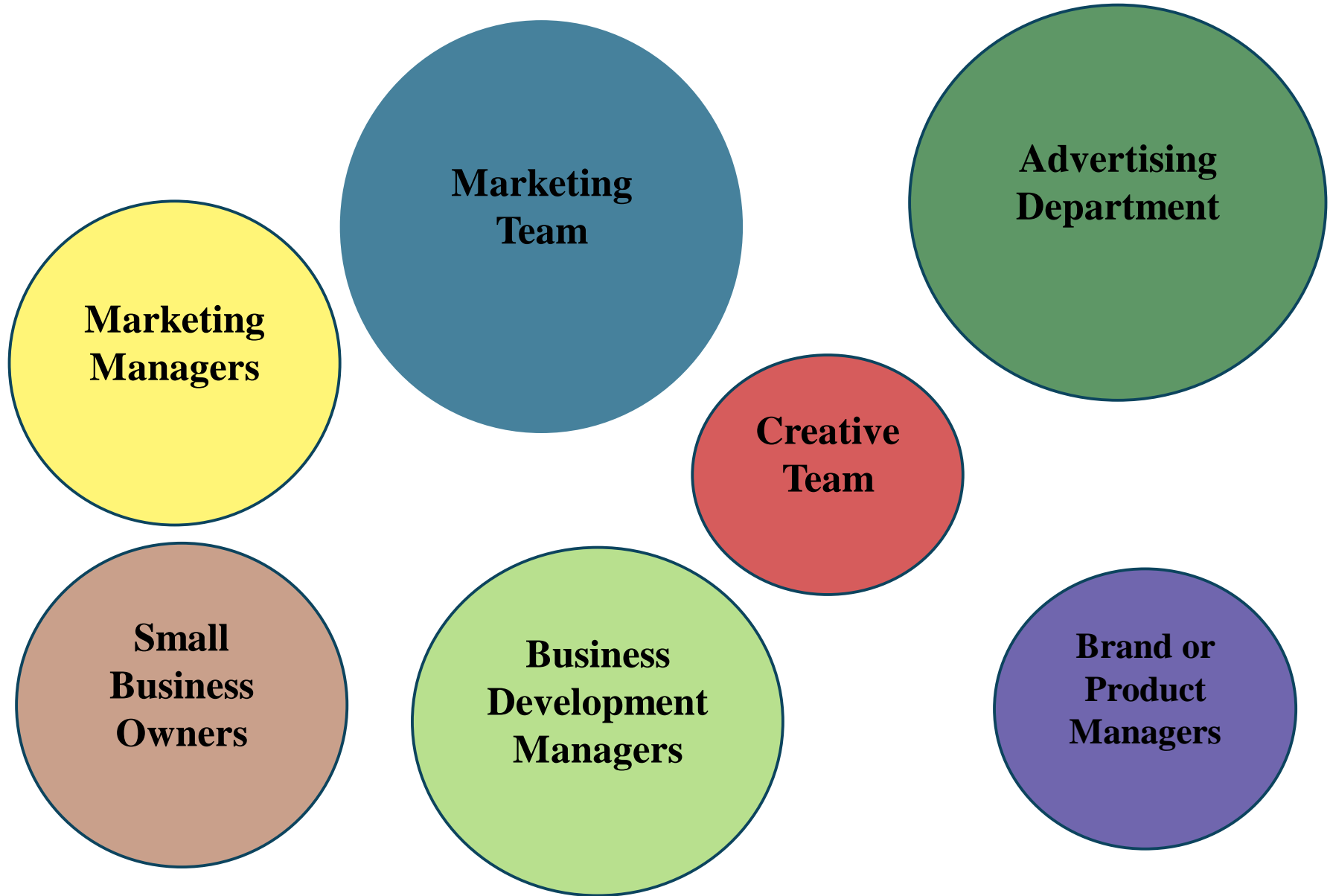
Fundamental Objectives Hierarchy
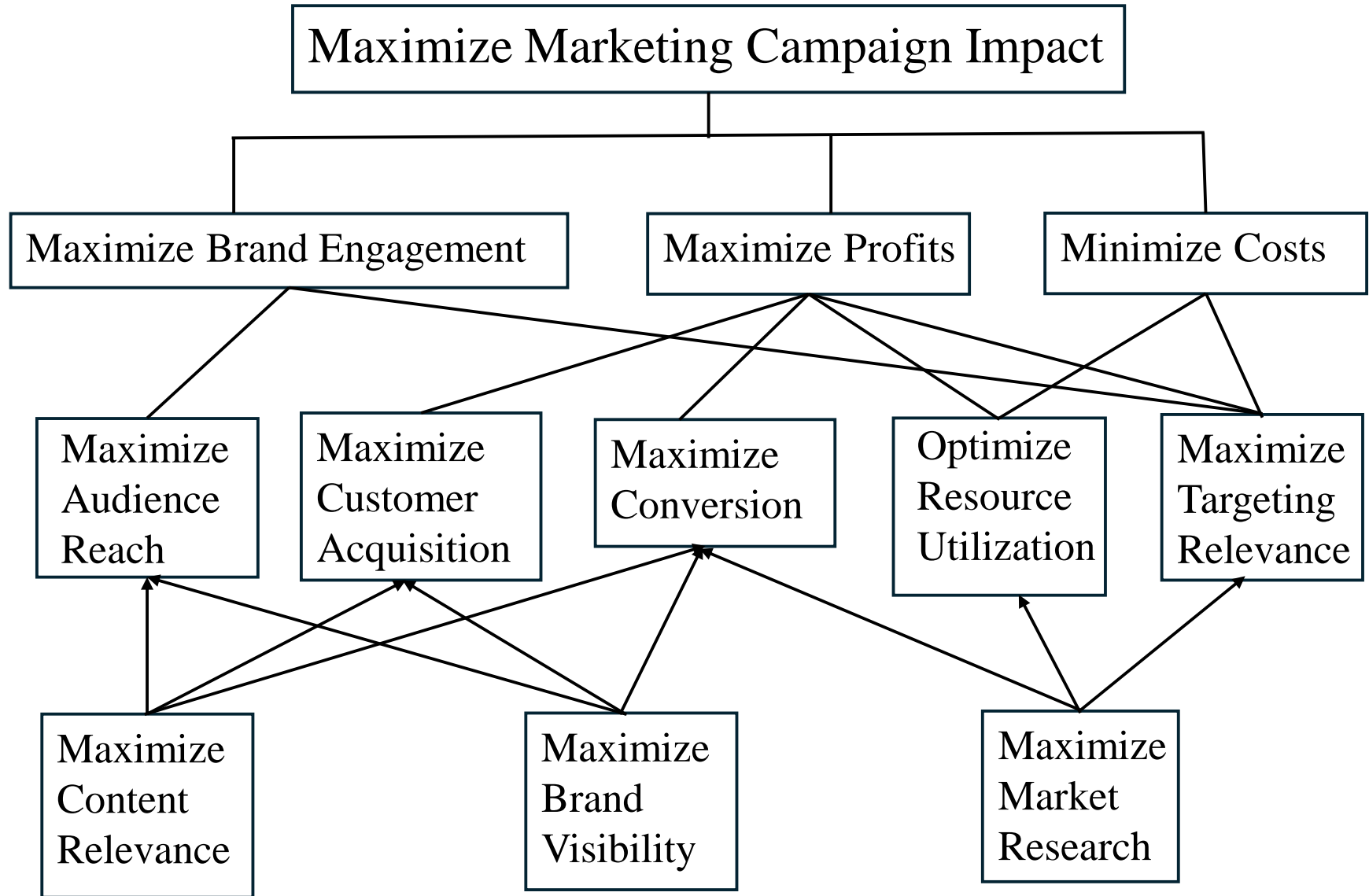
Alternatives

Alternatives

Facebook's user base spans various demographics and it offers sophisticated advertising tools for precise targeting and analytics. It's a preferred choice for marketers aiming to reach diverse audiences and maximize brand exposure.

Instagram's visually-driven platform facilitates engaging visual storytelling, making it ideal for brands aiming to connect with younger demographics.

YouTube is the largest video-sharing platform on which brands can showcase products/services, engage through tutorials or vlogs, and reach a global audience effectively.

TikTok's short-form video content and viral trends with creative tools and algorithms, can engage authentically with different group of audiences through trending challenges and entertaining content.

Pinterest is a platform focused on inspiration and discovery, Marketers can utilize it to showcase products to drive website traffic and tap into its highly engaged user base seeking ideas for purchases.

Attributes

Attribute	Description
Reach	Reach refers to the potential audience size or the number of users who can potentially see the marketing content on the platform. It's typically measured in millions and indicates the platform's ability to expose content to a wide audience.
CPM (Cost per Mile)	CPM is a metric used to measure the cost of reaching one thousand impressions of an advertisement. It represents the cost advertisers pay for their ads to be displayed a thousand times on the platform.
Reliability	Reliability refers to the platform's consistency and dependability in delivering advertising content to the intended audience. A reliable platform ensures that ads are displayed as scheduled and reaches the targeted users consistently.
Number of Ad Formats Available	This attribute represents the variety and flexibility of advertising formats offered by the platform. A higher number of ad formats available provides advertisers with more options to create engaging and effective marketing campaigns tailored to their objectives and target audience.
Average Conversion Rate	Average conversion rate measures the percentage of users who take a desired action, such as making a purchase or signing up for a service, after interacting with the advertising content on the platform. A higher average conversion rate indicates that the platform is more effective in converting users into customers or leads.

Consequence Table

Attributes

Platform	Age Group	Reach (in millions)	Average Conversion Rate	Number of ad formats available	Reliablility (%)	CPM ($)
Instagram	18-24	45.1	1.50%	8	85	3.5
Instagram	25-34	48.2	1.50%	8	85	3.5
Instagram	35-44	33.1	1.50%	8	85	3.5
Instagram	45-54	20.7	1.50%	8	85	3.5
Instagram	55-64	13.1	1.50%	8	85	3.5
Instagram	65+	9.7	1.50%	8	85	3.5
Facebook	18-24	35.9	9.21%	7	95	14.9
Facebook	25-34	46.6	9.21%	7	95	14.9
Facebook	35-44	35.9	9.21%	7	95	14.9
Facebook	45-54	26.9	9.21%	7	95	14.9
Facebook	55-64	22.1	9.21%	7	95	14.9
Facebook	65+	23.1	9.21%	7	95	14.9
Youtube	18-24	56.1	12%	6	90	6
Youtube	25-34	66.9	12%	6	90	6
Youtube	35-44	40.3	12%	6	90	6
Youtube	45-54	27.0	12%	6	90	6
Youtube	55-64	14.8	12%	6	90	6
Youtube	65+	11.6	12%	6	90	6
Pinterest	18-24	23.7	2.80%	9	75	3.5
Pinterest	25-34	25.4	2.80%	9	75	3.5
Pinterest	35-44	14.8	2.80%	9	75	3.5
Pinterest	45-54	9.6	2.80%	9	75	3.5
Pinterest	55-64	7.2	2.80%	9	75	3.5
Pinterest	65+	3.8	2.80%	9	75	3.5
Tiktok	18-24	27.1	1.10%	10	80	3.21
Tiktok	25-34	28.6	1.10%	10	80	3.21
Tiktok	35-44	19.4	1.10%	10	80	3.21
Tiktok	45-54	7.6	1.10%	10	80	3.21
Tiktok	55-64	5.9	1.10%	10	80	3.21
Tiktok	65+	2.0	1.10%	10	80	3.21

Alternatives

Example of User modified Consequence Table

Attributes

Alternatives

Platform	Age Group	Reach (in millions)	Average Conversion Rate	Number of ad formats available	Reliablility (%)	CPM ($)
Instagram	35-44	33.1	1.50%	8	85	3.5
Facebook	35-44	35.9	9.21%	7	95	14.9
Youtube	35-44	40.3	12%	6	90	6
Pinterest	35-44	14.8	2.80%	9	75	3.5
Tiktok	35-44	19.4	1.10%	10	80	3.21

If the user selects the targeted age group as 35-44, we get the above consequence table.

Uncertainty with distribution

Factor	Uncertainty
Audience Demographics: Platform user composition.	High uncertainty due to dynamic changes in user demographics and preferences.
Content Visibility: Exposure of marketing content within the platform's ecosystem.	Moderate uncertainty influenced by platform algorithms, content trends, and user engagement.
Advertising Costs: The cost structure for advertising on the platform.	High uncertainty due to fluctuating demand, competition, and platform policies.
Ad Performance: The effectiveness of ads in driving desired outcomes.	Moderate uncertainty influenced by ad targeting, creative quality, and audience responsiveness.
Ad Placement: The placement options available for ads on the platform.	Moderate uncertainty influenced by user attention span, ad format preferences, and platform updates.
Ad Format Innovation: The introduction of new ad formats and features.	High uncertainty due to the unpredictable nature of technological advancements and user adoption rates.
Conversion Rates: The likelihood of converting social media interactions into profitable actions or sales.	High uncertainty due to diverse audience behavior, purchase intent, and market dynamics.
Seasonal Trends: The impact of seasonal variations on consumer behavior, affecting ad performance and revenue.	Moderate uncertainty influenced by seasonal fluctuations in demand, purchasing behavior, and content engagement.

Risk Table

Risk Event	Likelihood	Consequences	Severity	Mitigation Strategies
Marketing Cost Overruns	High	Reduced budget for other activities, decreased ROI	High	Regular monitoring of marketing expenses, contingency planning, prioritization of expenses
Platform performance issues	Moderate	Decreased reach, poor user experience, reputation damage	Moderate	Thorough platform testing, regular performance audits, prompt resolution of issues
Changes in market trends	Extreme	Shift in audience preferences, increased competition	High	Continuous market research, flexibility in strategy, agile approach to marketing campaigns, collaboration with influencers and brand ambassadors
Fluctuating Ad Engagement	Moderate	Inconsistent engagement with marketing content	Low	Continuously analyze ad performance metrics and adjust targeting and content strategies accordingly.
Resource constraints	High	Reduced productivity, project delays	Medium	Resource allocation optimization, prioritization of tasks, outsourcing non-core activities, cross-training team members
Technological obsolescence	Medium	Reduced efficiency, increased costs	Moderate	Continuous technology assessment, adoption of emerging technologies, regular upgrades and maintenance
Ineffective communication	Medium	Misunderstandings, project delays	Medium	Clear communication channels, regular status updates, documentation of decisions and agreements, conflict resolution strategies
Failure to meet marketing goals	High	Decreased ROI, brand reputation damage	Extreme	Comprehensive market analysis, clear objectives, regular performance evaluation, strong collaboration with influencers and partners
Technical Glitches	Low	Technical issues or bugs affecting campaign performance	Low	Implement rigorous testing protocols before launching campaigns.

Risk Matrix

Likelihood \ Consequence	Low 1	Moderate 2	Medium 3	High 4	Extreme 5
Extreme 5				Changes in market trends	
High 4			Resource constraints	Marketing Cost Overruns	Failure to meet marketing goals
Medium 3		Technological obsolescence	Ineffective communication	Platform performance issues	
Moderate 2	Fluctuating Ad engagement	Platform performance issues			
Low 1	Technical glitches				

DSS Model Approach

<u>User Input:</u>
Prompt the user to input their target audience age group, preferred number of ad formats, and budget per mile.

<u>Gathering User Preferences :</u>
Gather user preferences for key attributes such as reach, average conversion rate, and cost per mile (CPM).

<u>Preference Weight Assignment:</u>
Assign swing weights to attributes based on user preferences. Normalize swing weights to ensure they sum up to 100%.

<u>Utility Calculation:</u>
Define utility functions for each attribute based on worst and best values.
Calculate the utility score for each platform using the weighted sum of attribute utilities.

<u>Monte Carlo Simulation:</u>
Simulate multiple scenarios using the Monte Carlo method to incorporate uncertainty in attribute values.
Calculate the mean utility for each platform based on simulated attribute values.

<u>Platform Selection:</u>
Identify the platform with the highest mean utility as the recommended platform for the user.

<u>Sensitivity Analysis:</u>
Allow the user to input a platform for sensitivity analysis.
Conduct sensitivity analysis to explore how variations in platform attributes affect utility. Plot the sensitivity of the MAU values to changes in attribute values.

<u>Interactive Prompt:</u>
Allow the user to continue performing sensitivity analysis for different platforms or exit the program.

Example

For example, consider a new business specializing in a subscription-based service providing dogs with a curated selection of toys, treats, and grooming items. This initiative caters to the increasing population of young pet owners aged 25-34, capitalizing on the rising trend of pet parenting among this demographic.

```
Enter the target audience age group (e.g., 18-24, 25-34, 35-44, 45-54, 55-64, 65+): 25-34
Enter the number of ad formats preferred from 1-10: 5
Enter the budget per mile starting from 3.21 (in USD): 8
```

Filter the dataset based on the user's input and display the available platforms based on the user input.

```
Available platforms based on your preferences for social media marketing:
       platform      reach  ...  reliability    cpm
1     Instagram    48.1806  ...           85   3.50
13      Youtube    66.9200  ...           90   6.00
19    Pinterest    25.3800  ...           75   3.50
25       Tiktok    28.5516  ...           80   3.21
```

For their first marketing campaign, this new business prioritizes maximizing brand engagement as its foremost objective, followed by cost minimization and, finally, profit maximization. By emphasizing the establishment of strong connections with potential customers and sustainable revenue generation, the company aims to lay a solid foundation for long-term success. Hence the ranking would be:

```
Please rank your preferences for the following criteria from 1-3 (1 highest, 3 lowest:
 Maximizing brand engagement: 1
 Maximizing profits: 3
 Minimizing cost: 2
```

Rank	Weight
1	50%
2	25%
3	15%

Attribute	Weight
Reliability	5%
Number of Ad formats available	5%

Evaluating alternatives

After calculating utility scores for each platform attribute based on defined utility functions and user-provided preferences and employing Monte Carlo simulations to incorporate uncertainty in attribute values, the model displays the platforms with their mean utility scores.

```
Mean Utility for Each Platform:
Instagram: 0.6334
Youtube: 0.7197
Pinterest: 0.4437
Tiktok: 0.5027
```
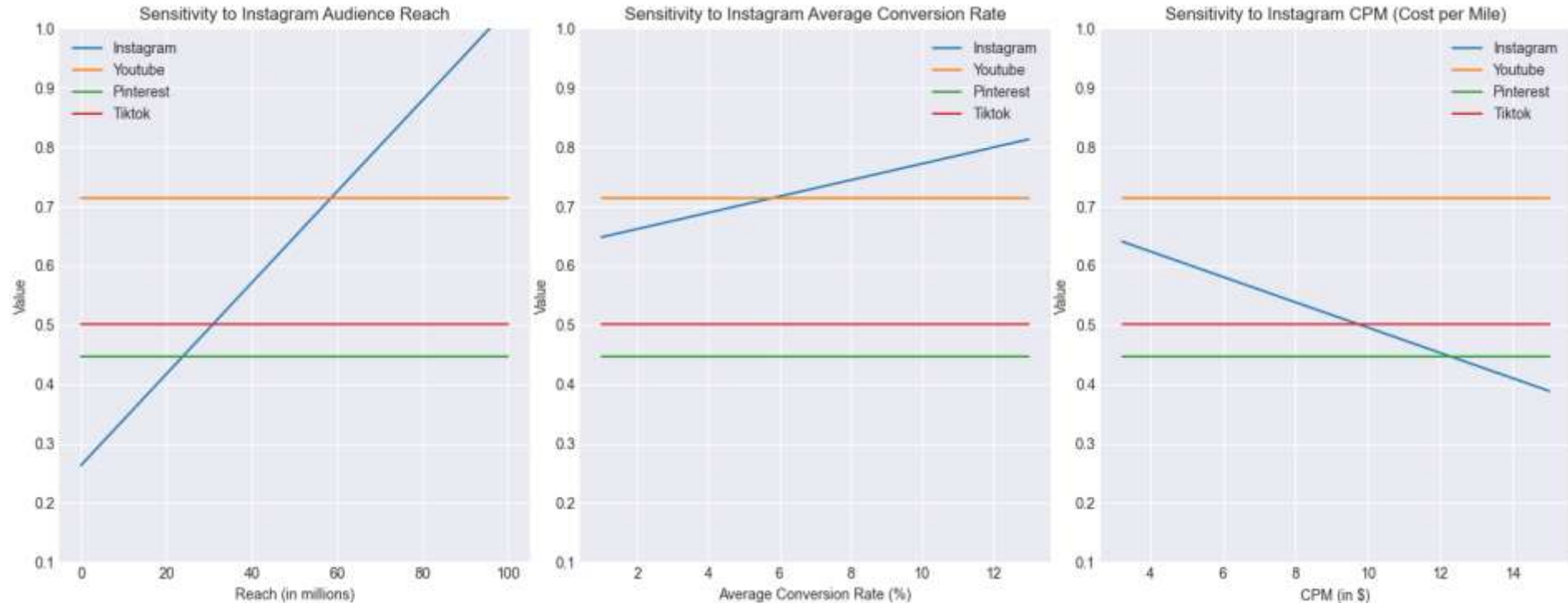
The platform with the highest mean utility is displayed as the best platform.

```
The best platform based on your preferences is: YOUTUBE
```

Sensitivity Analysis

The company aims to evaluate Instagram, its second-best option, against the top-recommended platform.

```
Enter the platform for sensitivity analysis (type 'done' to exit): Instagram
```


- In terms of Reach, to surpass YouTube's value, Instagram's audience reach needs to exceed a certain threshold where its value surpasses that of YouTube. The decision would change if the number of Instagram users crosses about 60 million.
- In terms of Avg Conversion rate, the decision would change if conversion rate of about 5.8% could be achieved using Instagram marketing.
- For CPM, Since YouTube's value does not change with CPM and remains constant at its highest value, Instagram cannot surpass YouTube's value by adjusting CPM. Even at Instagram's lowest CPM, where its value is highest, it does not exceed YouTube's.

Recommendation

The best platform based on your preferences is: YOUTUBE

YouTube may have the highest mean utility. However, exploring the sensitivity analysis results allows the decision maker to assess this recommendation and potentially identify alternative platforms that may offer better performance under certain scenarios.

Limitations

1.Data Accuracy: The effectiveness of the model heavily relies on the accuracy and reliability of the input data. Inaccurate or incomplete data may lead to biased results and inaccurate recommendations.

2.Simplification of Factors: The model may oversimplify the complex dynamics of social media marketing by focusing on a limited set of attributes. In reality, there are numerous other factors that can influence the success of a marketing campaign.

3.Assumption of Independence: The model may assume independence among the different attributes and factors considered, whereas in reality, these factors may be interrelated and affect each other in complex ways.

4.Static Nature: The model may treat certain factors as static or unchanging over time, whereas in reality, audience preferences, platform algorithms, and market conditions are constantly evolving.

5.Limited Scope: : The model might only consider a limited set of platforms and metrics, failing to capture the full range of marketing options.

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THANK YOU!