A colorful funnel with several layers

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**Metrocar Funnel Analysis Report**

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## Executive Summary

This analysis provides a thorough examination of the customer funnel, examining the steps from app download to sign-up, ride request, driver acceptance, ride completion, payments, and review. The objective is to pinpoint areas for enhancement and refine the customer experience to yield superior results.

Key findings from the analysis include:

1. **Drop-offs:** The most significant drop-off in the customer journey occurs between the ride acceptance and ride completion, where we lose nearly 51% of potential customers. In-depth analysis revealed that drop-off occurs due to high demand volumes during peak hours (8 a.m.-10a.m. and 4 p.m. -8 p.m.). It was also observed that many users don’t complete their first ride.
2. **Conversion Rate**: The overall conversion rate stands at 25%. This underscores the necessity of enhancing the user experience and optimizing conversion paths.
3. **Segmentation Insights:** The analysis revealed variations in the funnel performance across different customer segments. The 35 to 44-year-old age group had the highest performance, with approximately 5200 users, but it's important to note that the age of 5300 users was not disclosed. Evaluating the age segments for which we have data indicated that the majority of users fall within the 35-44 and 25-34 age brackets.
4. **User Experience:** Roughly 40% of the rides received ratings below the satisfactory threshold, 10% were rated as satisfactory, and 40% were rated above satisfactory.
5. **ios/androids vs. Web platform:** The ios devices users exhibited highest conversion rate. Conversion rate of android users was also significant whereas the conversion rate of web users was minimal.

Recommendations based on these findings include:

1. **Optimizing Initial Engagement:** The significant drop-off indicates a need for improvements in the strategy to increase number of active drivers during peak hours. I suggest applying dynamic pricing strategies (price surge) during high demand hours. I also recommend advocating for ride-sharing alternatives to boost user engagement. Moreover, users might be offered discount voucher on first ride to improve the user engagement.
2. **Customized Strategies for Segments:** Analysis suggests that our marketing and engagement efforts may need to be tailored more specifically towards 25-34 and 35-44 age brackets.
3. **Reallocating Marketing Resources:** In terms of marketing budget allocation, I recommend prioritizing iOS platforms. We should channel the majority of our budget towards iOS (55%), while reducing the allocation for the web platform (5%).

## Context

Metrocar operates on a business model that leverages a platform, linking passengers with drivers via a mobile app. Acting as a mediator between passengers and drivers, Metrocar offers an intuitive platform to streamline the ride-booking process.

This project aims to analyze the customer funnel of Metrocar, to identify areas for improvement and optimization.

### Why Funnel Analysis for Metrocar:

Conducting funnel analysis for a project like Metrocar service is crucial for understanding and optimizing the user journey. By breaking down the steps that a user takes to book a ride, from opening the app to completing the ride and submitting the review, funnel analysis helps identify bottlenecks and areas of friction that may be hindering conversions. Funnel analysis help in allocating resources more effectively and boost customer acquisition and retention.

### Metrocar Funnel:

The customer funnel for Metrocar includes the following stages:

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1. **App Download:** A user downloads the app from the App Store or Google Play Store.
2. **Signup:** The user creates an account in the app, including their name, email, phone number, and payment information.
3. **Request Ride:** The user opens the app and requests a ride by entering their pickup location, destination, and ride capacity (2 to 6 riders).
4. **Driver Acceptance:** A nearby driver receives the ride request and accepts the ride.
5. **Ride:** The driver arrives at the pickup location, and the user gets in the car and rides to their destination.
6. **Payment:** After the ride, the user is charged automatically through the app, and a receipt is sent to their email.
7. **Review:** The user is prompted to rate their driver and leave a review of their ride experience.

### Business Questions:

The primary emphasis in the funnel analysis was placed on addressing following business queries posed by stakeholders to reveal crucial insights for enhancing particular aspects of the customer funnel.

1. What steps of the funnel should we research and improve? Are there any specific drop-off points preventing users from completing their first ride?
2. Metrocar currently supports 3 different platforms: iOS, android, and web. To recommend where to focus our marketing budget for the upcoming year, what insights can we make based on the platform?
3. What age groups perform best at each stage of our funnel? Which age group(s) likely contain our target customers?
4. Surge pricing is the practice of increasing the price of goods or services when there is the greatest demand for them. If we want to adopt a price-surging strategy, what does the distribution of ride requests look like throughout the day?
5. What part of our funnel has the lowest conversion rate? What can we do to improve this part of the funnel?

### The ****Dataset structure****

The company's data is structured in a relational database, which consists of five primary tables, and was utilized for analysis.

Description of each table and its columns.is as follows

1. **app\_downloads**: contains information about app downloads
   * app\_download\_key: unique id of an app download
   * platform: ios, android or web
   * download\_ts: download timestamp
2. **signups**: contains information about new user signups
   * user\_id: primary id for a user
   * session\_id: id of app download
   * signup\_ts: signup timestamp
   * age\_range: the age range the user belongs to
3. **ride\_requests**: contains information about rides
   * ride\_id: primary id for a ride
   * user\_id: foreign key to user (requester)
   * driver\_id: foreign key to driver
   * request\_ts: ride request timestamp
   * accept\_ts: driver accept timestamp
   * pickup\_location: pickup coordinates
   * destination\_location: destination coordinates
   * pickup\_ts: pickup timestamp
   * dropoff\_ts: dropoff timestamp
   * cancel\_ts: ride cancel timestamp (accept, pickup and dropoff timestamps may be null)
4. **transactions**: contains information about financial transactions based on completed rides:
   * ride\_id: foreign key to ride
   * purchase\_amount\_usd: purchase amount in USD
   * charge\_status: approved, cancelled
   * transaction\_ts: transaction timestamp
5. **reviews**: contains information about driver reviews once rides are completed
   * review\_id: primary id of review
   * ride\_id: foreign key to ride
   * driver\_id: foreign key to driver
   * user\_id: foreign key to user (requester)
   * rating: rating from 0 to 5
   * free\_response: text response given by user/requester

## Database Exploration, Extraction, Aggregation and Funnel construction(PostgreSQL):

The **PostgreSQL** language has been employed to explore and retrieve data from the database. The database has been explored and data aggregation and extraction queries were applied to obtain required tables for analysis.

* **Filtering in aggregation functions:**

**“Predicate”/”Filtering conditions”** were applied inside aggregate functions to retrieve users related aggregate tables. Moreover, efficient aggregated dataset for methodical dashboards was prepared.

* **Segment contribution calculations:**

Window functions was applied to reduce the need for multiple table scans thus leading to improved query performance while calculating segment contributions.

* **Setting up funnel calculations:**
  + **Customer funnel:** Customer funnel has been created using percent of previous approach. The first step of the funnel, which tracks app downloads, has been determined by counting the unique download keys. The second step counts all user IDs, which are unique values generated upon user signup. All subsequent steps of the funnel involve counting the distinct user IDs at the time of the recorded timestamp for each event in the funnel (ride request, ride accepted, ride completed, payment, and review). The conversion rate and drop-off between each stage have been calculated using the **lag()** function.

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* + **Ride Level Funnel:** To obtain a deeper comprehension of the entire customer journey on a wider scale and identify any potential causes for the significant decrease between the accepted and completed rides, a ride level funnel has also been created. This allowed us to further observe that numerous rides are not accepted and that there is a 10% drop-off rate between rides that are accepted and those that are completed.

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Further analysis is carried out in PostgreSQL, and the tables are then exported to Tableau for the generation of visualizations and more in-depth analysis.

## Analysis and Results

### Dashboards

Dynamic Dashboards have been created in Tableau to convey the insights in the report and presentation, and to empower stakeholders to explore the data efficiently and effectively on their own. Below section addresses first business question.

**Business Question 1: What steps of the funnel should we research and improve? Are there any specific drop-off points preventing users from completing their first ride?**

### Customer Level Funnel and Ride Level Funnel: Dynamic Dashboard

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Dashboard visualizes the **Customer Level Funnel and Ride Level Funnel** granularity with following specifications:

* Filters allow users to examine specific platforms, age ranges, and date ranges.
* Labels show the absolute number of customers at each step, and allow users to choose between additional labels with either the percent of previous or percent of top.
* To suggest accurate data driven solutions, the difference in time between each stage of the funnel per each ride has been calculated.

***The most significant decline in the customer funnel occurs between the stages of Ride Accepted and Completed, with a drastic decrease of nearly 50%. Out of 12,278 accepted rides, only 6,233 were completed.***

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[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)

### Service Time Dashboard

The dashboard enables stakeholders to monitor the time elapsed between ride request, acceptance, pickup, and total service duration, thereby emphasizing the impact of waiting time on ride cancellation, completion rates, and overall customer retention.

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[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)

By examining all the rides (not just the initial one), it becomes evident that the majority of rides are accepted within a timeframe of 3 to 12 minutes. Once a ride is accepted, the majority of users are picked up within 3 to 15 minutes.

The impact of wait time on the cancellation rate is evident. Observing the time frame between 8am and 10am, we can discern that approximately 3,200 rides are declined on an hourly basis.

### Drivers’ Workload Dashboard

The dashboard provided allows users to monitor the driver's daily and weekly workload and availability.

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[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)

During the entire week, we observe a consistent pattern, with the average number of active drivers, completed rides, and cancellations showing a strong resemblance.

A strategy can be developed to redirect the attention of drivers to underutilized regions to attract more patrons. Moreover, it's recommended to enhance the visibility of ride-sharing options to accommodate a larger number of passengers simultaneously. This approach will undoubtedly boost the effectiveness of the service while simultaneously reducing ride costs.

**Business Question 2: Metrocar currently supports 3 different platforms: IOS, android, and web. To recommend where to focus our marketing budget for the upcoming year, what insights can we make based on the platform?**

### Performance by Platform Dashboard

The following dashboard recommends allocating a substantial portion of the marketing budget to the iOS platform, as it currently yields the best results. While the web channel is not performing well and can be trimmed, the app provides a more user-friendly service experience. I propose reallocating the funds saved from the web channel's budget reduction to the Android platform, considering that approximately 70% of global users have an Android device, according to ([Statista](https://www.statista.com/statistics/272698/global-market-share-held-by-mobile-operating-systems-since-2009/)).

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[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)

I propose distributing 55% of the marketing budget to the iOS platform, 40% to Android to maximize its potential, and the remaining 5% to the Web.

**Business Question 3: What age groups perform best at each stage of our funnel? Which age group(s) likely contain our target customers?**

### Performance by Age-Range Dashboard

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[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)

The age group between 35 and 44 years old performs the best, with approximately 5200 users. However, it's important to note that 5300 users did not disclose their age, which could potentially alter the actual age group with the highest performance. A deeper understanding of the users in the undisclosed age category could provide a more accurate answer. Nevertheless, the majority of market research on ride-sharing indicates that 45% of users between 18 and 29 years old use the service, while 36% are in the 30-49 age group. Considering this data, I recommend focusing on the 25-34 and 35-44 age groups, with slightly more emphasis on the former. This is because they may be more receptive to adopting shared rides, which is a strategy proposed to reduce the gap between ride requests and cancellations.

**Business Question 4: Surge pricing is the practice of increasing the price of goods or services when there is the greatest demand for them. If we want to adopt a price-surging strategy, what does the distribution of ride requests look like throughout the day?**

### Hourly Based Performance Dashboard

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[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)

Two daily peaks for ride requests occur, one from 8 to 9 AM and another from 4 to 7 PM. Implementing surge pricing can motivate more drivers to join the platform when demand is high, helping to balance supply and demand. This can result in quicker service and increased availability for customers. However, surge pricing can also lead to negative press and backlash from the public, potentially harming a company's reputation. Additionally, it might prompt regulatory examination in certain regions and cause customer attrition during peak pricing times, as some individuals may opt for alternative options or wait until prices normalize. The graph above demonstrates that the majority of ride requests happen between 8-10 AM when people are beginning their workday, and between 4 and 8 PM when they return home.

**Business Question 5: What part of our funnel has the lowest conversion rate? What can we do to improve this part of the funnel?**

The lowest conversion rate in the customer funnel takes place between the acceptance and completion of the ride, with nearly 51% of potential customers being lost at this stage. Upon further examination, it was found that this drop-off is attributed to elevated demand levels during peak hours, specifically between 8 a.m. and 10 a.m. and between 4 p.m. and 8 p.m. Additionally, it was noted that a substantial number of users do not finalize their initial ride.

The noticeable decline suggests that there is a requirement for strategic enhancements to boost the number of active drivers during peak times. I propose implementing dynamic pricing models (such as surge pricing) during times of high demand. Additionally, I recommend promoting ride-sharing options to enhance user participation. Furthermore, it may be beneficial to contemplate providing a discount following the completion of the initial ride. This approach could potentially motivate a larger number of users to experiment with the service, thereby enhancing the conversion rate at this juncture.

## Conclusion

The analysis of Metrocar's funnel has provided a comprehensive understanding of the customer journey's bottlenecks, enabling the optimization of customer conversion pathways and facilitating strategic decision-making. The following recommendations are suggested based on the report:

1. Conduct investigations to identify and address areas with high ride cancellation rates.
2. Promote driver availability in regions with a high incidence of ride cancellations.
3. Implement price surge strategies to enhance driver availability during peak hours, thereby reducing customer wait times.
4. Introduce a ride-sharing feature, allowing drivers to serve multiple passengers on a single trip.
5. Competitors offering ride-sharing options have reported services that are 20% more cost-effective and an average service time increase of 8 minutes.
6. Position ride-sharing as an environmentally friendly alternative by emphasizing its potential to reduce CO2 emissions through minimizing unnecessary driver travel.
7. Metrocar's primary target demographic consists of individuals aged 35 to 44, followed by those aged 25 to 34.
8. Collaborate with developers to estimate the resources required for algorithm development.
9. Allocate marketing budgets with a focus on iOS platforms (55%), Android platforms (40%), and a reduced allocation for web platforms (5%Top of Form)

## Appendix

1. [Statista](https://www.statista.com/statistics/272698/global-market-share-held-by-mobile-operating-systems-since-2009/)  2.[PostgreSQL Queries](https://docs.google.com/document/d/1nJwoivpIVM8rRdMgnz4FZSK54Yu4bZHnw46_lq9-aGk/edit?usp=sharing) 3.[Tableau Workbook](https://public.tableau.com/views/MetrocarFunnelAnalysi_SK/Customer_Ride_Funnel_Dashboard?:language=en-GB&publish=yes&:display_count=n&:origin=viz_share_link)