

# ANALYZING TRANSACTIONS AND ANOMALIES IN THE METAVERSE

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## A Comprehensive Analysis



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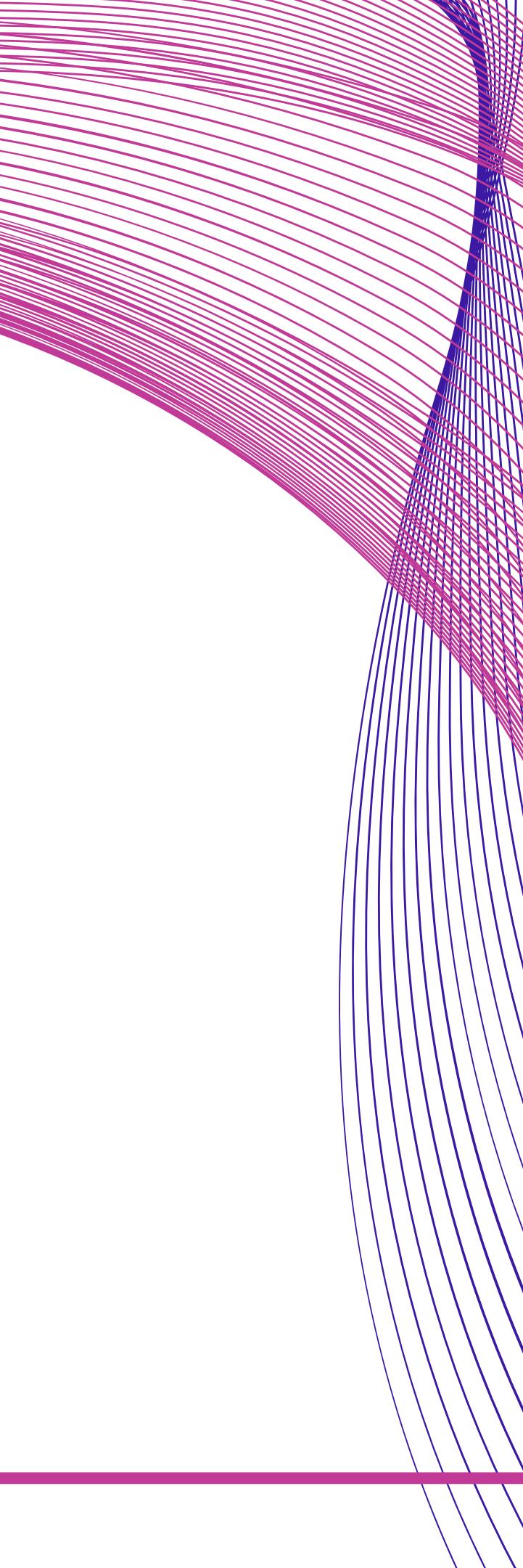
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# INTRODUCTION

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The metaverse is fast emerging as a revolutionary digital space where users can interact, socialize, and conduct a variety of transactions. As the metaverse continues to grow in popularity, understanding transaction dynamics, user behavior, and potential security risks is essential for fostering a secure and thriving virtual economy.

This analysis dives into a comprehensive dataset of transactions within the metaverse, providing insights into regional variations, temporal trends, and customer demographics.

By exploring this data, we aim to uncover patterns and trends that can inform strategies to enhance user engagement, optimize marketing efforts, and strengthen security protocols. This report presents key insights, actionable recommendations, and conclusions that will aid stakeholders in maximizing the potential of the metaverse while ensuring a safe and enjoyable environment for all users.

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# ABOUT

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This dataset covers a diverse range of transactions within a metaverse platform, reflecting the dynamic nature of virtual economies.

The dataset includes detailed information on transactions such as timestamps, sending and receiving addresses, transaction amounts, and types. It also provides additional context through user behavioral metrics, including login frequency, session duration, and purchase patterns. Furthermore, geographical data and risk assessments are incorporated, offering a comprehensive view of transaction activities across different regions and user profiles.

# PROBLEM STATEMENT

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As the metaverse evolves into a bustling digital marketplace, understanding the intricacies of transaction patterns and user behaviors becomes essential for ensuring its secure and efficient operation. Despite its potential, the metaverse faces challenges related to regional transaction disparities, temporal fluctuations in activity, and varied user engagement levels. Moreover, security concerns, such as phishing and scams, pose significant risks across different transaction methods.

# DATA CLEANING

```
--Date Cleaning
--Checking for NULLvalues
SELECT SUM(CASE WHEN [anomaly] IS NULL THEN 1 ELSE 0 END)
AS missing_count
FROM [dbo].[metaverse]

--Categorizing time_of_day
--To add time_of_day column
UPDATE [dbo].[metaverse]
SET time_of_day =
CASE
    WHEN [hour_of_day] BETWEEN 0 AND 11 THEN 'Morning'
    WHEN [hour_of_day] BETWEEN 12 AND 16 THEN 'Afternoon'
    ELSE 'Evening'
END;
```

# DATA CLEANING

```
;;
--Update [dbo].[metaverse]
SET month_of_year =
CASE
    WHEN MONTH([timestamp]) = 1 THEN 'January'
    WHEN MONTH([timestamp]) = 2 THEN 'February'
    WHEN MONTH([timestamp]) = 3 THEN 'March'
    WHEN MONTH([timestamp]) = 4 THEN 'April'
    WHEN MONTH([timestamp]) = 5 THEN 'May'
    WHEN MONTH([timestamp]) = 6 THEN 'June'
    WHEN MONTH([timestamp]) = 7 THEN 'July'
    WHEN MONTH([timestamp]) = 8 THEN 'August'
    WHEN MONTH([timestamp]) = 9 THEN 'September'
    WHEN MONTH([timestamp]) = 10 THEN 'October'
    WHEN MONTH([timestamp]) = 11 THEN 'November'
    ELSE 'December'
END

--To group timestamp by season
ALTER TABLE [dbo].[metaverse]
ADD season VARCHAR(10)

--Update [dbo].[metaverse]
SET season =
CASE
WHEN MONTH([timestamp]) IN (12,1,2) THEN 'Winter'
WHEN MONTH([timestamp]) IN (3,4,5) THEN 'Spring'
WHEN MONTH([timestamp]) IN (6,7,8) THEN 'Summer'
ELSE 'Autumn'
END
```

# DATA EXPLORATION

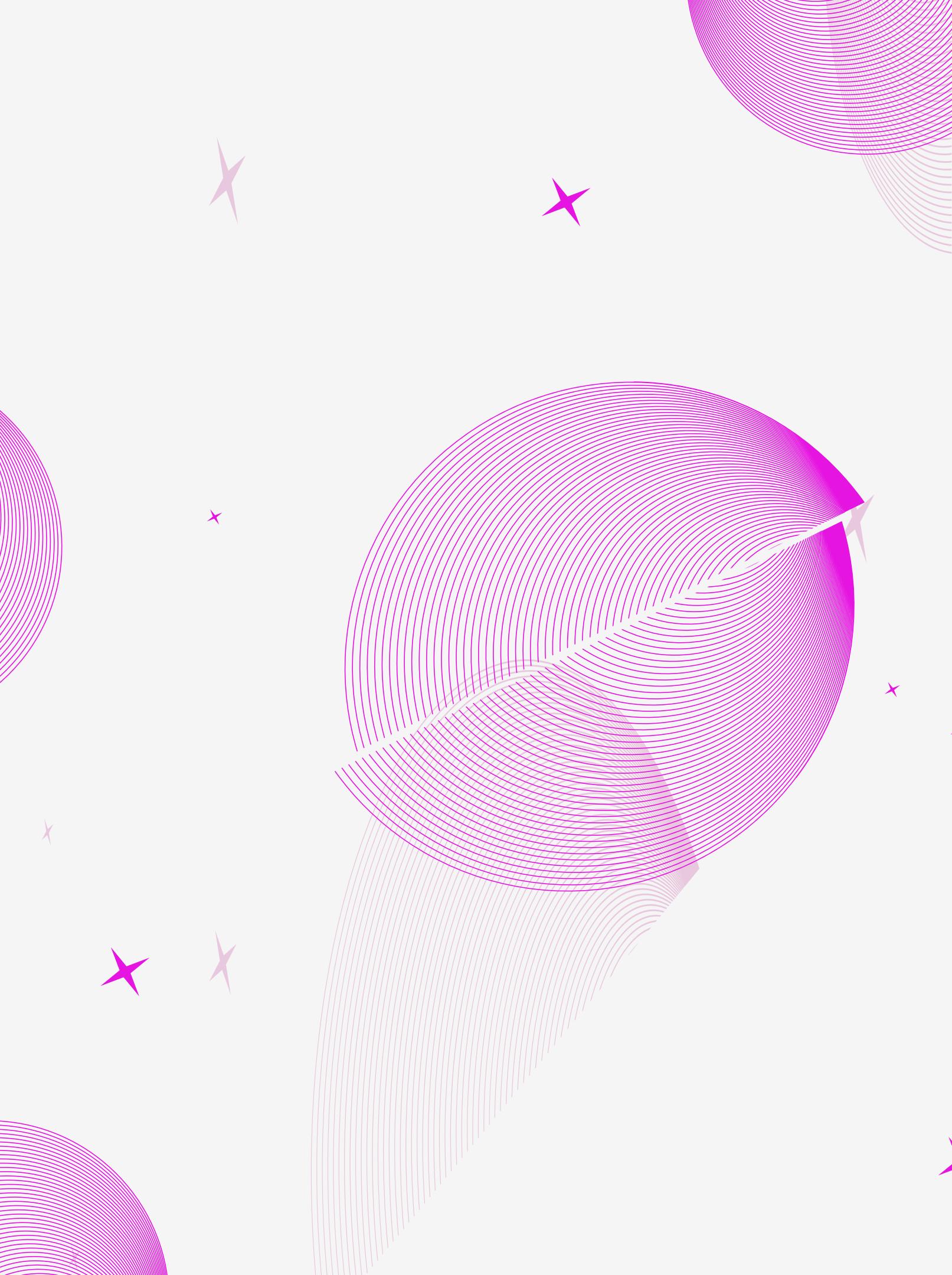
```
--Regional Analysis  
--How does the average transaction amount vary across different regions?  
SELECT [location_region], ROUND(AVG([amount]),0) AS avg_amount  
FROM [dbo].[metaverse]  
GROUP BY [location_region]  
ORDER BY avg_amount DESC  
  
--What are the peak transaction times during the day, and how do they vary by region?  
SELECT [time_of_day], [location_region], COUNT(*) AS total_count  
FROM [dbo].[metaverse]  
GROUP BY [location_region], [time_of_day]  
ORDER BY [location_region], total_count DESC  
  
--Which regions have the highest average transaction values?  
SELECT [location_region], ROUND(AVG([amount]), 0) AS avg_amount  
FROM [dbo].[metaverse]  
GROUP BY [location_region]  
ORDER BY avg_amount DESC  
  
--How do risk score vary across different payment methods and regions?  
SELECT [transaction_type], [location_region], ROUND(AVG([risk_score]),0) AS avg_risk  
FROM [dbo].[metaverse]  
GROUP BY [transaction_type], location_region  
ORDER BY [location_region], avg_risk DESC  
  
--Temporal Analysis  
--What is the trend of transaction volumes over the past year on a monthly basis?  
SELECT ROUND(SUM([amount]),0) AS avg_amount, [month_of_year]  
FROM [dbo].[metaverse]  
GROUP BY [month_of_year]  
ORDER BY avg_amount DESC
```

# DATA EXPLORATION

```
--Temporal Analysis  
--What is the trend of transaction volumes over the past year on a monthly basis?  
]SELECT ROUND(SUM([amount]),0) AS avg_amount, [month_of_year]  
FROM [dbo].[metaverse]  
GROUP BY [month_of_year]  
ORDER BY avg_amount DESC  
  
--How do seasonal trends affect transaction volumes and amounts?  
]SELECT ROUND(SUM([amount]),0) AS total_amount, [season]  
FROM [dbo].[metaverse]  
GROUP BY [season]  
ORDER BY total_amount DESC  
  
--Customer Analysis  
--What is the correlation between customer age and their average transaction amount?  
]SELECT ROUND(AVG([amount]),0) AS avg_amount, [age_group]  
FROM [dbo].[metaverse]  
GROUP BY [age_group]  
ORDER BY avg_amount DESC  
  
--What is the average session duration between customer age groups?  
]SELECT AVG([session_duration]) AS avg_duration, [age_group]  
FROM [dbo].[metaverse]  
GROUP BY [age_group]  
ORDER BY avg_duration  
  
--What customer age group has the highest login frequency?  
]SELECT SUM([login_frequency]) AS total_frequency, [age_group]  
FROM [dbo].[metaverse]  
GROUP BY [age_group]  
ORDER BY total_frequency
```

# INSIGHTS

- Asia has the highest average transaction amount, while Africa has the least.
- For all five regions, morning has the most sales followed by evening, then afternoon.
- Asia stands out as having the highest average transaction values.
- Phishing and scams are most common across all regions, with transfers having the lowest risk score.
- July had the most sales, followed by May, with June having the least.
- Spring had the most sales, followed by autumn, with winter having the least.
- The veteran age group has the lowest average transaction amount.
- The veteran age group has the highest average session duration.
- The veteran age group has the highest login frequency.



# RECOMMENDATIONS



- Tailor marketing and promotional strategies to regions like Asia with higher transaction amounts. Implement initiatives to boost transaction amounts in regions like Africa.
- Schedule marketing campaigns and platform updates during peak transaction times (morning and evening) to maximize user engagement and sales.
- Strengthen security protocols and user education programs to mitigate phishing and scam risks. Promote transfer methods as safer transaction options.
- Analyze successful factors contributing to high sales in July and May, and develop targeted strategies to replicate this success in other months.

# RECOMMENDATIONS

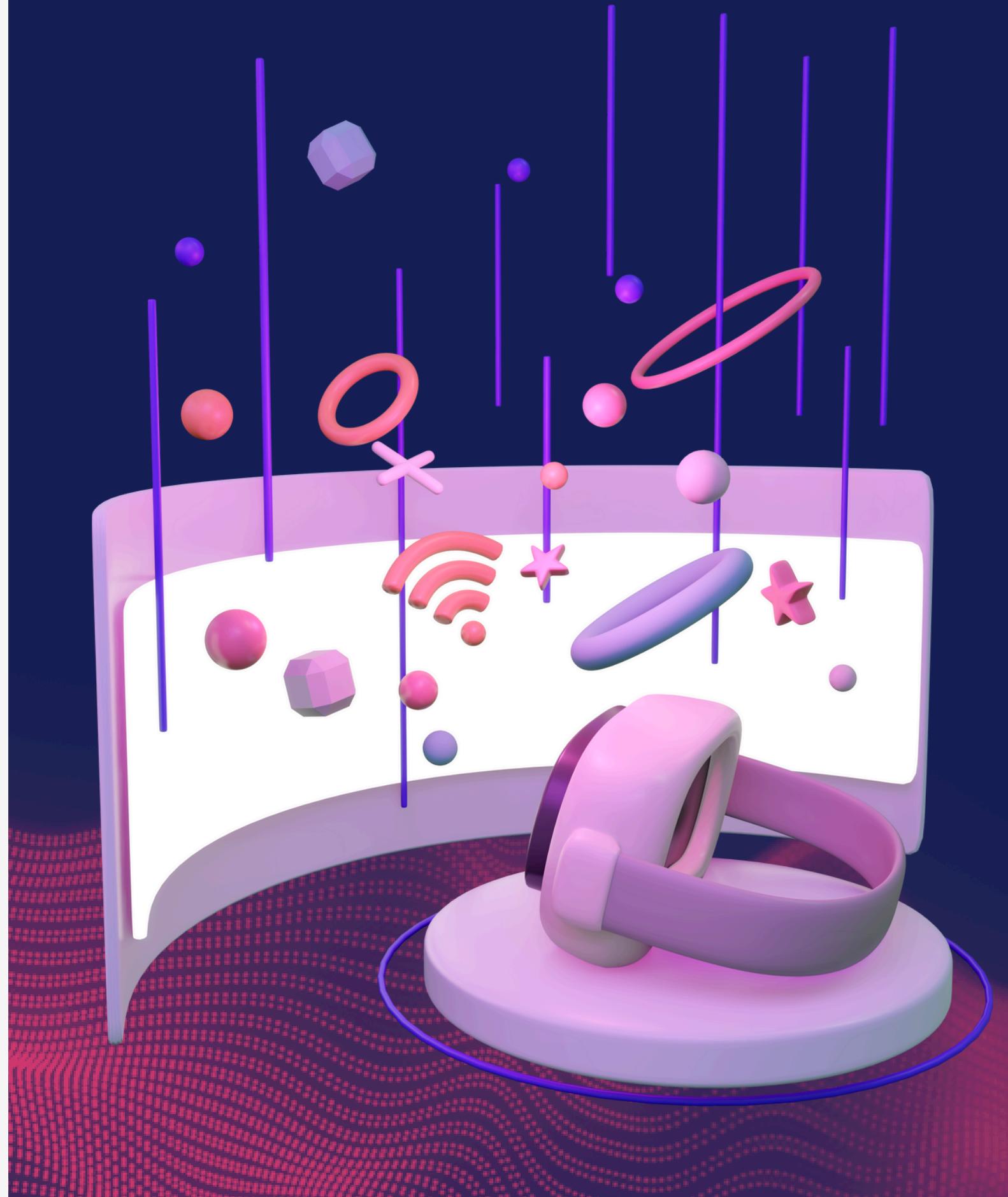


- Develop seasonal promotions focused on spring and autumn to capitalize on higher transaction volumes. Investigate reasons for lower winter sales and address potential barriers.
- Create personalized offers and loyalty programs for the veteran age group to increase their transaction amounts. Understand their spending behavior and preferences for better targeting.
- Introduce engaging content and targeted advertisements for the veteran age group to make use of their higher session durations and enhance their user experience.
- Deliver timely and relevant updates, offers, and notifications to the veteran age group, focusing on retention strategies to maintain their high engagement levels.

# CONCLUSION

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This comprehensive analysis of metaverse transaction data provides valuable insights into regional differences, temporal trends, and customer behaviors. By leveraging these insights, we can enhance marketing strategies, improve user experience, and strengthen security measures. Tailoring our approach to specific regions, seasonal variations, and user demographics will help in maximizing revenue and ensuring a secure and engaging environment for all users.





**THANK YOU!**