Refining Revenue and Engagement Growth Strategies through Service Usage Analysis in Online Astrology Service Company

A Mid-Term report for the BDM capstone Project

Submitted by

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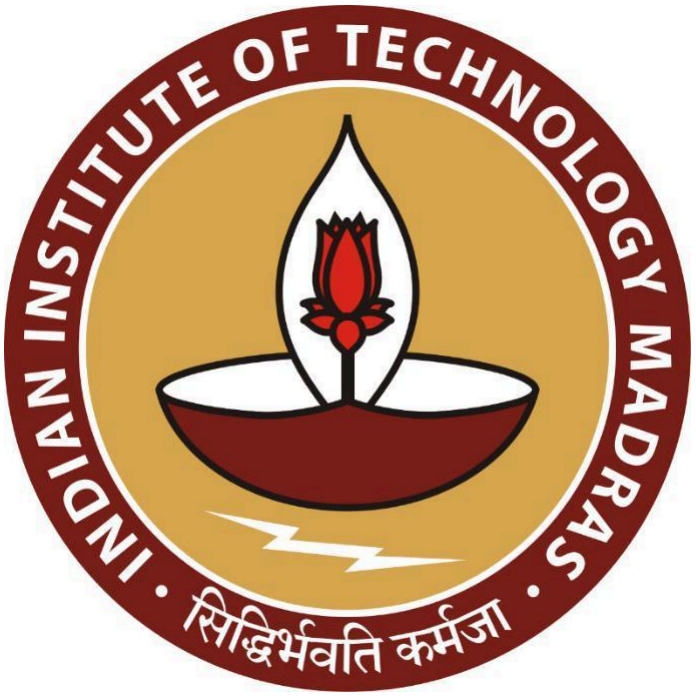

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Contents

1 Executive Summary

Title: Refining Revenue and Engagement Growth Strategies through Service Usage Analysis in Online Astrology Service Company

Serving as a sequel to the proposal statement, this mid-term report explores various datasets and selects the best fit for solving the core business problems of Hindu Panchang Astrology app, namely: **low user retention, high cost per acquisition, and low revenue generation.**

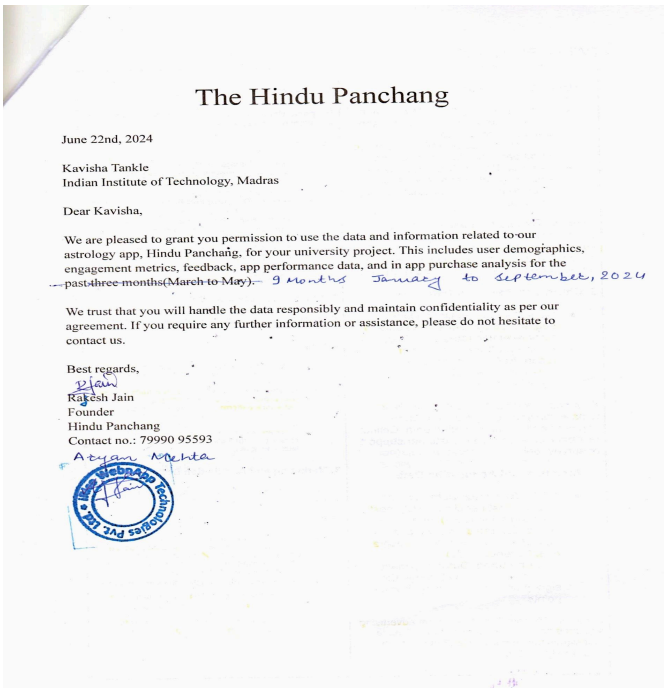
Hindu Panchang works on an online B2C model and is run by Mr. Rajesh and his son Mr. Aryan from Ujjain, Madhya Pradesh. The firm makes money from providing paid services such as personalized Shubh Muhurat/Jyotish Paramarsh Advices, e-Selling spiritual items and Birth Chart pdfs. As a close-knit, family-operated team, they manage the business without a large employee base, focusing on demystifying astrology and making it accessible to everyone.

Since marketing challenges and the lack of technological adaptation are at the heart of the three interlinked problems, addressing user retention and high customer acquisition costs will naturally follow once we improve revenue and marketing schemes. Our aim is to observe who seeks our services and what specific needs they have. By understanding the demands of our target audience, we can polish our offerings and target promotions for better gains in this field.

For this report, my task is to study relevant datasets to address these issues and extend the analysis in the final report to uncover critical insights and patterns that directly impact revenue growth and user attention. I will begin by describing the various datasets gathered around user in-app activities, marketing channel performance, demographics, and in-app service purchase transactions, along with key variables/vocabulary of app analytics. Next, we'll funnel down to the data that can directly affect revenue performance, make it clean and prepared for conducting reliable analysis. After outlining key statistics, we'll finally present key insights through graphical representations.

2 Proof of originality of the Data {Link}

- **Letter from Hindu Panchang:**



The Hindu Panchang

June 22nd, 2024

Kavisha Tankle
Indian Institute of Technology, Madras

Dear Kavisha,

We are pleased to grant you permission to use the data and information related to our astrology app, Hindu Panchang, for your university project. This includes user demographics, engagement metrics, feedback, app performance data, and in app purchase analysis for the ~~past three months(March to May).~~ 9 Months January to September, 2024

We trust that you will handle the data responsibly and maintain confidentiality as per our agreement. If you require any further information or assistance, please do not hesitate to contact us.

Best regards,
Rjain
Rakesh Jain
Founder
Hindu Panchang
Contact no.: 79990 95593
Aryan Mehta

Figure 1: *Authorization letter* from Mr. Ramesh and Mr. Aryan, founders of the app, granting access to the relevant data from their app's private portal and Google Analytics dashboard.*

**This letter was drafted during the first meeting on 19th June 2024, and manually edited and signed by the founders during the third meeting on 16th September 2024.*

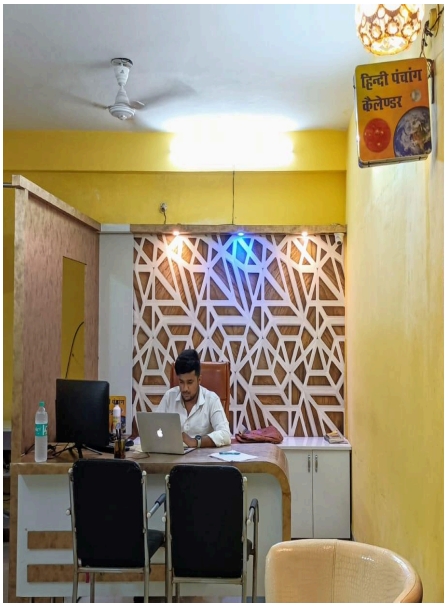
Here's the **official link** to the Hindu Panchang app: **Hindu Panchang**

- **Interaction with the founder:**

Below is the link to the video recording** of my discussion with Mr. Aryan, where we talked about their business challenges:
Interaction with the co-founder about their business issues

*** Recorded during the second meeting on 12th September 2024, around 12 PM, outside a college campus in Ujjain.*

- **Images related to Hindu Panchang:**



Figures 2 & 3: *Inside the Hindu Panchang main office in Ujjain, and a photo of me with the co-founder at his workspace during the third meeting, taken on 16th September 2024, around 1 PM.*

Figure 4: *A glimpse of the app's homepage as viewed on a mobile device.*

3 Metadata & Descriptive Statistics

Here's the link to the gathered dataset: Hindu Panchang: Performance Analysis

The dataset is about 12 key tables that cover metrics on user activity, marketing channel performance, and revenue streams for the app over a 3.5-month period, from June 1 to September 16, 2024. I collected this data during the delayed third meeting with the owner, which **shifted the data range from March-May 2024 (as proposed before) to June-September 2024.** I imported the data related to user retention and marketing channels from **the app Analytics report(csv file)**, while manually extracting in-app purchase records of successful transactions from the **app's private dashboard** into google spreadsheet.

Collectively, the dataset comprises 3,436 records and 28 columns. Additionally, there are two tiny overview cards picked from the app's Analytics report, that shows the devices users access the app from and the primary social platforms used for app promotion. **All the tables are structured labeled in the spreadsheet along with their respective timelines for clarity.** Some columns, such as Age, Gender, Language, Birth Date, and BirthPlace, have missing entries where information was unavailable, marked as "NA". Confidential user information, such as phone numbers and emails, has been replaced with "x" and "*". The data will need to be merged, cleaned, and modified to ensure its reliability and usability for analysis.

- **Table 1, 2, 3 & 15:** Transaction records for **4 key paid services (e-Birth Chart PDFs, Paramarsh, Shubh Muhurat, e-Shopping).** Stores customer info, transaction data, and location. Table 15 is a combo of table 1, 2, 3.
- **Table 4:** Quantifies astrological services and Ad groups based on their **cost per conversion and overall costs.** It provides insights into which services attract the most users through ads.
- **Table 5:** Stores **number of active users countrywise.**
- **Table 6:** Lists the **most viewed app pages.**
- **Table 7:** Tabulates from **what marketing channels new users find the app,** with most coming directly, which indicates strong brand recognition. However, organic search, referrals, and social media bring in the least new users, hiding as potential ways to popularize the app.

- **Table 8:** Similar to Table 7, narrating how users in general reach the app via various channels. Here direct sessions again stand out, indicating a high level of returning users. However, **there are also unassigned sessions, which may point to tracking challenges.**
- **Table 9 & 10:** Outlines the **key events that lead to user conversions** within the app. **Page views** are the most frequent, exceeding 26 million, followed by **scrolls** and **session starts**, indicating strong user engagement. **Clicks** are lower, suggesting users engage with content but may not take actions consistently. Events like **'Aaj Ka Vrat'** show moderate interest, while **viewing search results** and **shopping** have minimal conversions, flagging the areas for improvement. Table 10 is similar to Table 9, providing a breakdown of the **most frequent events occurring within the app.**
- **Table 11:** Presents weekly user activity over 12-weeks. It includes: **Active Users–** The total number of users who engaged with the app each week; **New Users–** The number of first-time users who accessed the app during the week; **Average Engagement Time–** The mean time (in seconds) that active users spent on the app, indicating how engaging the content is.
- **Table 12:** Tracks active users over 30, 7, and 1-day periods to show interaction patterns on monthly, weekly and daily basis.
- **Table 13:** Tracks **weekly user retention for 5 weeks.** It shows how many users were active on the app in Week 0 (initial week) and came back to use it in Weeks 1 to 5. It guides us on when to apply loyalty offers, by recording how many users return after their first visit.
- **Table 14:** Compares the apps **Returning Users Rate (RUR, in %)** with other apps in the **"Books & Reference" category on Google Play.** It shows the RUR% alongside the **median, 25th percentile, and 75th percentile of returning user rates from peer apps, day wise from June to September.** This data gives an idea on how well the app retains users compared to competitors in this industry.

Key Variables/Columns of the Dataset:

Column Name	Description	Unit (Data Type)
Country ID	Represents the country where the user is located (e.g., IN for India, NP for Nepal)	ID (String)
Active Users	Number of users actively engaging with the app in the specified country	Users (Integer)
Views	Total views for specific pages (e.g., astrology pages)	Views (Integer)
Nth Week(/Day)	Indicates which week(/day) of the analysis period the data belongs to (e.g., 0 for first week(/day))	Weeks(/Days) (Integer)
New Users	Number of newly acquired users during a specific time period	Users (Integer)
Average Engagement Time	The average time a user spends engaging with the app	Seconds (float)
Returning Users Rate (RUR)	The percentage of users who come back to the app	Percentage (%, float)
Peers' Median (Books & Reference)	The middle value of returning user rates for similar apps in the Books & Reference category	Percentage (%, float)
25th Percentile (Books & Reference)	The lower 25% of returning user rates in the Books & Reference category	Percentage (%, float)
75th Percentile (Books & Reference)	The upper 25% of returning user rates in the Books & Reference category	Percentage (%, float)
First User Primary Channel Group	The acquisition channel (e.g., Direct Search, Referral) for new users	Channel (String)
Sessions	Number of sessions for each primary channel group (How do users arrive most of the time?)	Sessions freq. count
Event Name	Describes key events happening within the app (e.g., page view, scroll, session start)	Event (String)
Event Count	Total number of occurrences for each event	Events freq.count

Service Name	Name of the astrological service/ product(spiritual item)	Service (String)
Category	Type of astrological service (e.g., birth chart, products)	Category (String)
Total Revenue	Revenue generated from each transaction	INR
Transaction Date	The date of the transaction	Date (DD/MM/YYYY)
Transaction Time	The time of the transaction	Time (HH:MM:SS)
Sex	Gender of the user (Male/Female)	Male/ Female
Age	Age of the user making the transaction	Years
Age Category	Age category of the user (e.g., fifteen to twenty-four years)	String
Language	The language used by the user (Hindi or English)	Hindi/ English
City	City where the user is located	String
State	State where the user is located	String

- **Key Descriptive Statistics:**

For this project, the most important datasets to analyze are the **transaction data of in-app service purchases**, **geo-demographics & Ad group conversions.** These datasets provide the best parameters to meet user and location-specific needs, optimize services, and improve targeted marketing to boost revenue by understanding customer preferences and demographics. Other datasets offer useful insights into user engagement trends, but they don't directly impact revenue or marketing due to uncontrollable external factors and competition from better-funded peers (as discussed in the proposal). Despite this, they will still help assess the app's current status and will be fairly included in the final report.

In-app Service Transactions & geo-demographics:

- **Total Transactions**: 297 (Online Birth Chart: 82, Paramarsh Counselling: 63, Shubh Muhurat Counselling: 64, Products: 88)
- **Total Revenue Generated**: ₹1,53,929 (Online Birth Chart: ₹8,333, Paramarsh Counselling: ₹39,900, Shubh Muhurat Counselling: ₹13,164, Products: ₹92,532)

- **Average Revenue per Transaction**: ₹518 (Online Birth Chart: ₹101, Paramarsh Counselling: ₹633, Shubh Muhurat Counselling: ₹205, Products: ₹1,052)
- **Range of Transaction Amount**: ₹6000-201 (Online Birth Chart: ₹299-50, Paramarsh Counselling: ₹1,100-500, Shubh Muhurat Counselling: ₹501-201, Products: ₹6000-150)
- **Median of Total Revenue**: ₹299 (Online Birth Chart: ₹50, Paramarsh Counselling: ₹500, Shubh Muhurat Counselling: ₹201, Product: ₹550)
- **Standard Deviation of Total Revenue**: ₹787 (Online Birth Chart: ₹100, Paramarsh Counselling: ₹207, Shubh Muhurat Counselling: ₹37, Products: ₹1,234)
- **Gender Wise Distribution**: Male: 129 transactions (73.74%), Female: 78 transactions (26.26%)
- **Average Age of Users**: 29.8 years
- **Language Preference of Astrological Content**: Hindi: 98%, English: 2%
- **State Wise Transactions**: Rajasthan (58, 19.5%), Uttar Pradesh (56, 18.8%), Bihar (33, 11.1%), Madhya Pradesh (26, 8.7%), Maharashtra (24, 8.0%) are the top contributions.
- **Most and Least paid Service**: Summary Birth Chart: 65 Transactions, Marriage & Mundan Ceremony (Shubh Muhurat Advice): 1 Transaction.
- **Total Active Users All Over the World**: 1,138,907 (80 countries)
- **Countries with Highest Active Users**: **India:** 1,138,907 (~98%), **Nepal:** 12,296 (1.08%), **United States:** 1,761 (0.15%), **United Arab Emirates:** 1,174 (0.10%), **France**: 528 (0.05%), **Germany:** 524 (0.05%), **Canada:** 499 (0.04%).

Ad Group Performance (based on services advertized):

- **Birth Chart(aka Janm Kundali)** had the most conversions but was costlier overall.
- **Vivah/Shiksha** had the least conversions, making it less efficient.
- **Total Cost cost of Ad campaign**: ₹317,145.55
- **Total Conversions**: 107,614
- **Min Cost per Conversion**: ₹1,160.23 (**Vivah/Shiksha**)
- **Max Cost per Conversion**: ₹3,656.17 (**Kundli Milan**)
- **Average Cost per Conversion through service Ad**: ₹3,448.58

4 Detailed Explanation of Analysis Process/Method

I started by cleaning the data to ensure it was accurate. For Table 15, I removed the irrelevant columns (like phone no., email), then combined everything into one table with important columns like service name, transaction amount, and user details. I created new columns like "Category" to categorize services by their subcategories & "Age Group" columns by converting and grouping birth dates into similar age groups. I also splitted transaction dates from timestamps and separated cities from states for better analysis of revenue trends (hourly, daily, weekly, and monthly).

Segmenting User Demographics and Demands:

I used Google spreadsheet to group users by service category, age, gender, and location. By creating **pivot tables**, I could quickly see which groups and services contributed the most to revenue. **Excel Pareto Charts, Stacked bar charts, donut/3D pie charts, simple and clustered column charts** made it easy to compare these groups and spot trends. The **Grouping Pivot Item** feature, along with **line and combo graphs** of transaction times and total/average revenue, showed when during the day, week, and month revenue was highest.

Geographic Distribution:

I used **spreadsheets's map charts** to visualize where our users are located and which regions had the most active users and generated the most revenue. This helped identify areas that need more marketing efforts.

Correlation b/w Revenue and Engagement Analysis:

I summed weekly revenue from Table 15 to match with the timelines of Table 11 and then merged the resulting data into Table 11. Then I used **correlation tools and scatter plots**, to find connections between active/new users, engagement time, and revenue. This showed that longer sessions and more frequent users are likely to spend more.

Revenue Trends & Retention:

First, I calculated retention rates from Table 13, by dividing the number of users who retained post week 0 (in weeks 1 -5) by the total number of users in week 0. Then, I grouped weekly revenue from Table 15 to align with the timelines in Table 13 and combined the new data together. Then I plotted **line graphs** to track user retention and revenue trends over time. This can tell when users leave and where revenue starts falling, so we can pinpoint when to step in with new strategies & tactics to boost engagement and sales during periods of declining revenue & retention. This analysis is yet to be finalized.

5 Results and Findings

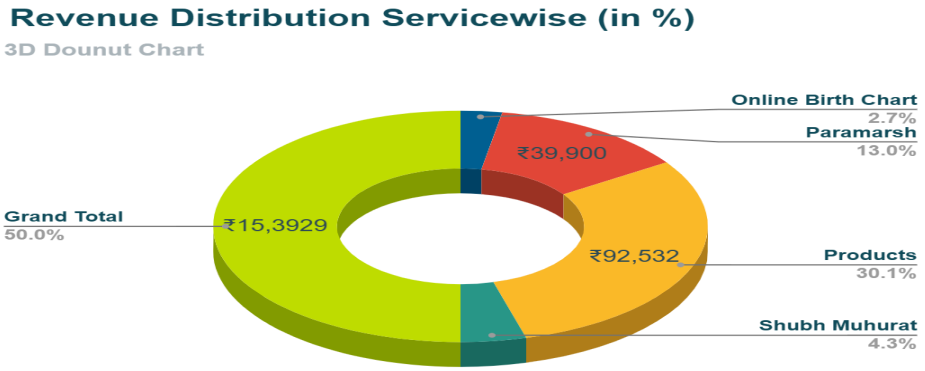


Fig. 5: As per the **donut chart, Products(spiritual items)** bring the most revenue (30%), while **Online Birth Chart** contributes the least (2.7%). We should promote the Online Birth Chart service more.

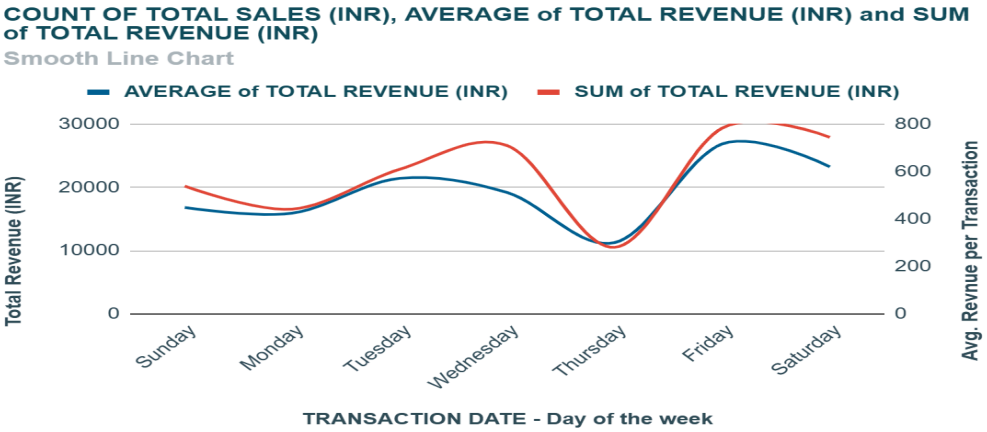


Fig. 6: As per **this line chart,** revenue gains are **highest on Wednesdays and Fridays**, while **Thursdays are slower**. It makes sense to focus marketing on the days when people spend more.

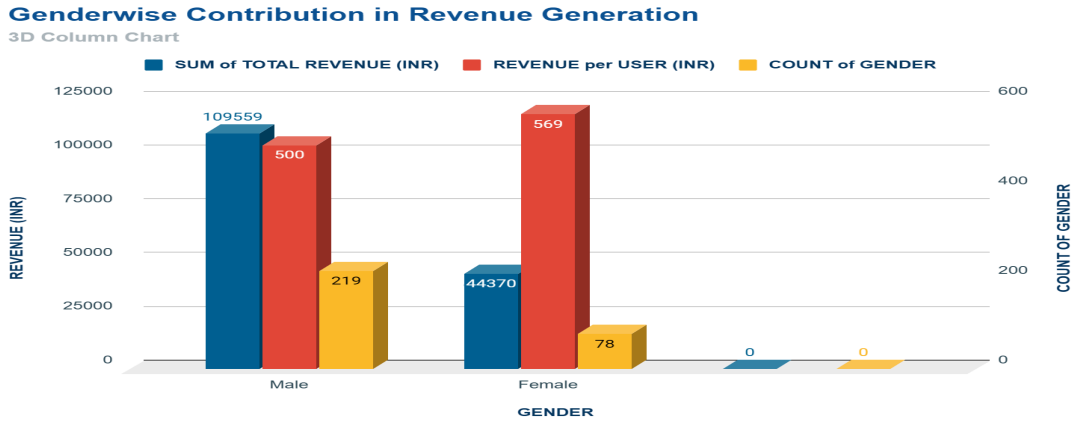


Fig 7: As per the **col. chart, males** bring more total revenue, but **women spend more per transaction**. Targeting women with special offers could increase sales and hence overall growth.