EXPLORING CRITICAL USER JOURNEY AND BEHAVIOR BY ANALYTICS TOOLS

 $\mathbf{B}\mathbf{y}$

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This Report Presented in Partial Fulfilment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY
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APPROVAL

This Project titled "Exploring critical user journey and behaviour By Analytics Tools" submitted by Fahmidul Hasan, ID No: 111-15-1258 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 9 July, 2020.

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Md. Sadekur Rahman, Assistant Professor, Department of CSE, Daffodil International University**. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree.

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We might want to thank our entire course mate in Daffodil International University, who participated in this exchange while finishing the course work.

ABSTRACT

Analytics Manager was my Internship Role. I am always very much interested in virtual or online users' behavior. How they think, how they act, and how they behave with an online service or product. On the other hand online users and their activity is growing day by day. With the growing number of users lots of online business and services setting up. In online or virtual business data is the main key matter. To complete my internship I had chosen the analytics manager role. So that I can work with data and user behaviour. My Internship sponsored company was Maya. Maya is the online based leading health company In Bangladesh. They also started to expand their business in UAE and some Arabian countries. They are supporting millions of users monthly by their Platforms. I had analytical access to all of them. I am really very thankful to them for trusting me with their data access. I believe I also got the standard organization culture from Maya. My responsibility was to track daily, monthly and weekly basis users data, behaviour journey and visualize them to help product end improvement and marketing decisions. Mainly I used google analytics, facebook analytics, firebase and Mixpanel.

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CHAPTER 01

INTRODUCTION

1.1 Introduction

Internship programs are like a library where everyone comes to learn and this is offered by some organizations who prefer to share knowledge with final year students and freshers. Internship program runs 1- 4 month. This program could be paid or unpaid. Basically the main purpose of the Internship is to prepare undergraduates or fresher's for the professional industry. On the other hand the intern will return the company's debt by doing some task. Internship positions are generally low maintenance whenever offered during a university semester and full-time whenever offered during the get-away periods.

1.2 Motivation

I am always very curious about user journey and behaviour. I found that Mayalogy Ltd. has an excellent reputation in Bangladeshi Startup community. They are the first ever Bangladeshi startup company who selected for Google Launchpad Accelerator. I knew that they always give high priority to their user experience. And hence They have an excellent user experience team. They had a great number of the user base. So I decided to apply for my Internship here as an Analytics Manager.

1.3 Objectives

The key objects of the Internship are as follows:

- To work with some great tools like Google analytics, facebook analytics and firebase.
- To work with a huge number of real user bases and their data.
- Exploring some costly paid tools like Mixpanel and hotjar.
- Adopting company culture
- To improve my communication skills
- To develop my administrative skills.
- To improve my analytical and research skills.
- Understanding of professional behaviour, beliefs.
- To gather knowledge how software based startups run.

1.4 Introduction to the Company

Mayalogy Ltd. was founded in 2011 as a health startup. From the beginning they were focused

on giving health knowledge access to Urban and rural at the same time. In 2015 they released the

Maya Android app. After that they also focused on Maya Chatbot in 2017. Now they take three

core platforms (App, Website, Messenger Bot) to serve their users. They have 100+ experts.

They are also now focused on Ai based health services. End of 2019 they hit 2 Million users.

Initially they were funded by Bangladesh Ict Division. They also had partnerships with Brac and

Aci And Robi

Head Office

Mayalogy Ltd.

9th floor, Bay's Bellavista, Road-11, Block- C, Banani, Dhaka-1212, Bangladesh

Mobile: +01884-552370

Email: info@maya.com.bd

1.5 Report Layout

The layout of my report is assorted by Chapter 1: Internship Introduction, Motivation, Internship

Objectives, and Introduction to the Company. Chapter 2: Organization Introduction, product and

Market Situation, Target Group, SWOT Analysis, Organizational Structure. Chapter 3: Daily

Task and Activities, Events and Activities, Project Task and Activities, Challenges. Chapter 4:

Competencies Earned, Smart Plan, Reflections, and Chapter 5: Discussion and Conclusion,

Scope for Further Career of the internship.

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CHAPTER 02

BACKGROUND

2.1 Introduction

Mayalogy Ltd. has a total of five teams. They named Product (App, Web, Backend, Ai) Content, Growth, Expert and Management & Hr. Users can ask Physical, psychosocial, and lifestyle questions from Maya App and website. Experts provide initial free health service to all of their users. They charge a very small amount from telemedicine service. Maya serves almost 10k users daily by answering questions.

2.2 Comparative Studies Comparison with related applications

	Mobile App
	Website
	Chatbot
	Kiosk
	E-commerce
П	Telemedicine

2.3 Comparison with related applications

Maya is an anonymous platform. Users can ask Maya from Online app and website without showing their name and identity. Only one expert can see some related basic info of users. So Maya has three types of targeted audiences.

- 1. Who has Internet access but has hardly expert (Doctor, psychosocial, Beautician) access.
- 2. Who has Internet access but has no expert (Doctor, psychosocial, Beautician) access.
- 3. Who feel comfort in taking service from an anonymous platform.
- 4. Who wants to save their times.

2.4 SWOT Analysis

SWOT means Strengths, Weaknesses, Opportunities, and Threats. By SWOT analysis business owners can analyze their businesses in relation to their competitors and the marketplace as a whole and can take strategies and decisions.

Following table showing the SWOT analysis of my internship.

Table 2.1 SWOT analysis

Strengths	Weaknesses	Opportunities	Threats
Strong Development	Data	Growing market.	Some free tools are
Knowledge.	visualization.	High salary range.	forcing to become
Quick understanding	Sql, R language.		premium.
of user base.			Third party agencies

2.5 Scope of the Problem solution

There are very few health startups in Bangladesh. Maya is a very old and leading one. They have a very great reputation from begining. They also try to follow a productive and shiny culture like Silicon valley. Each small team has a lead person. Each department and Chief operating officer. And the whole company has One Coo and Ceo. Ceo holds the top position of this company. Each team lead can take teamwise strategic decisions. But when the situation comes two or more teams should work as a team then Chief operating officers take lead. When any decision comes as a company wide then Coo or Ceo take the lead.

CHAPTER 03

REQUIREMENT SPECIFICATION

3.1 Daily Task and Activities

I joined Maya as an Analytics Manager intern. So I worked closely with the user experience team. I had also worked with a growth team by providing data.

My task was divided into four parts. Daily reporting, weekly reporting, monthly reporting, ondemand basis.

My daily work list are given below:

- Participating in Daily stand up meeting
- Tracking daily app, website, bot user audience by google analytics, Facebook analytics.
- Daily user behaviour tracking by google analytics and hotjar.
- App crash checking by Firebase crash report.

My Weekly work list are given below:

- Comparing Weekly audience data and find out if any major issue flagged.
- App and website traffic source analysis
- Checking location, gender, age demographic
- Exporting user id of specific segmented users

My Monthly work list are given below:

- Monthly Retention tracking, and finding any issues flagged.
- New user journey funnel visualization
- Old user journey visualization.
- Behaviour visualization

My on-demand work list are given below:

- Providing premium growth-related data like subscribe, unsubscribe.
- Paid / organic campaign visualization
- Helping to A/B testing

3.2 Requirement Collection and Analysis

Although there are different kinds of paid and free tools to measure key metrics of user journey and behaviour but it is really tough to understand users. Because in a startup and growing like Maya does lots of experiments by releasing quick features, and experimental campaigns. So the number of users go up and down very frequently. As a result, the user base and user behaviour also change. Although third party tools provide almost all the data a company needs. But still those are not enough. So different kinds of data need to be stored on the server. Those data increase server costs.

CHAPTER 04

Competencies and Smart Plan

4.1 Competencies Earned

From millions of data findings necessary data is a very tough task. For the very beginning it's just some number for all. But when it tracked down step by step at the end these numbers can talk! On the first day it's not possible, It takes time to understand. After working with millions of data from Maya I got some confidence how to deal with users and user data.

4.2 Smart Plan

Maya is now matured enough in the startup market. They have been working in this market for almost 9 years. Maya team explored two international programs like Google launchpad accelerator and Spring accelerator program. They learned a lot from them. They also worked with some other international consultancy. So they are smart enough in their work. They are also expanding their business in UAE and some other Arabian countries.

- 1. They research a lot to bring the best output.
- 2. They always believe in data.
- 3. They always adopt updated and useful technology very quickly.
- 4. They are very caring about their users.
- 5. They are concerned about user security.
- 6. They have created a very friendly environment in their office.

4.3 Reflections

My responsibility was to keep a sharp eye on user behaviour and journey. Making reports on a daily, weekly and monthly basis to help Maya to improve their user experience. My reports also help them to take right decisions on marketing and strategies.

4.4 Working in different platforms

Maya has different platforms like App, Website, and Messenger Bot by those they provide their services. Mainly they use 5 analytics tools to track data and make decisions.

- 1. Google analytics Very essential and powerful tools. It almost covers all of analytical data. It's mainly used for tracking apps and website user data.
- 2. Hotjar Awesome tool for tracking website's user journey. It shows user's engaging hit maps. It also captures user journey video.
- 3. Firebase This tool helps to track user crash reports and also for A/B testing.
- 4. Mixpanel It's app user journey visualization is great. So for deep driving in app user journeys helps most.
- 5. Facebook analytics Used for messenger bot user data.

Below here I am trying to give some examples of what actually I did and what I have learned during my Internship period In Mayalogy Ltd.

4.4.1 Daily Maya App Tracking by google analytics

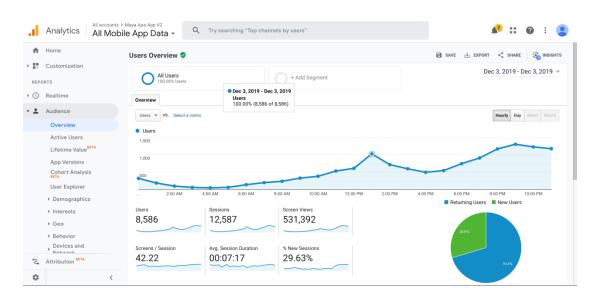


Figure 4.1: Daily app user overview

I am explaining some key data from the above screenshot. It's mainly one specific day's App user data.

- 1. Users: How many users have come to the December 3, 2019.
- 2. Avg. Session Time: How long they stay in each of their sessions.
- 3. Screen view: No of total screens have been explored by daily users.
- 4. This screen is also showing the pick time for maya App users. Maya pick time is 8-10 Pm.

4.4.2 Daily Maya App and website Tracking by google analytics

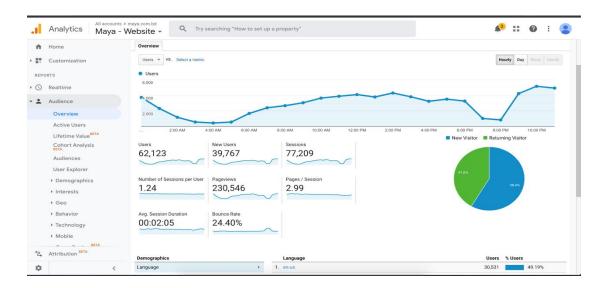
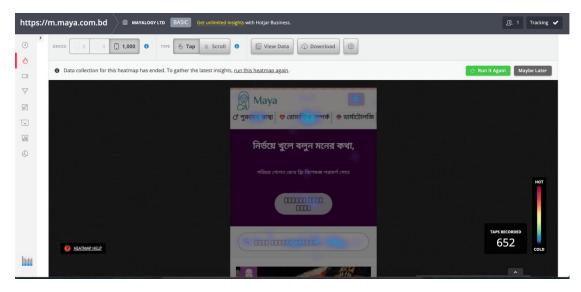


Figure 4.2: Daily Website user overview

Explaining website user data

- 1. New Users: How many new users explored the website on December 7, 2019.
- 2. Bounce rate: Percentage of users who landed on a website but they exited without exploring any others page.

4.4.3 Daily Maya website/ m-site Tracking by hotjar



Figure

4.3: Daily website heatmaps -1

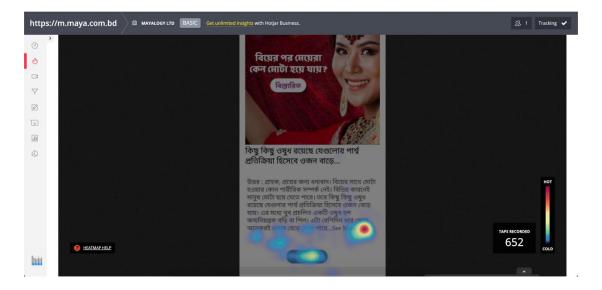


Figure 4.4: Daily website heatmaps -2

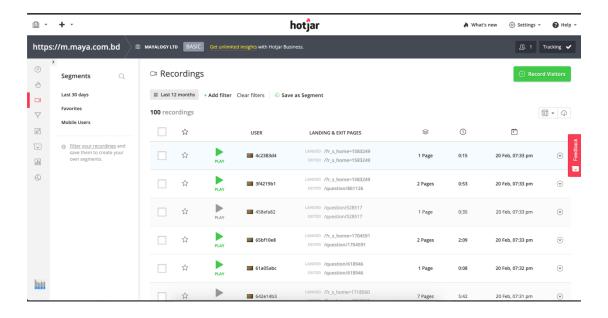


Figure 4.5: Web user journey video -1

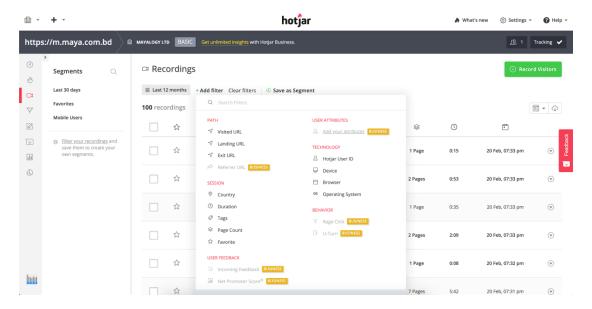


Figure 4.6: Web user journey video -2

Above two screenshots showing recorded user journey videos. My daily task was classifying those videos by filter different segments like time waise, landing and exit page wise. After that I used to watch some videos to check how features are going on and if the user is facing any problem or not.

4.4.4 Daily Maya App's crash report Tracking by firebase

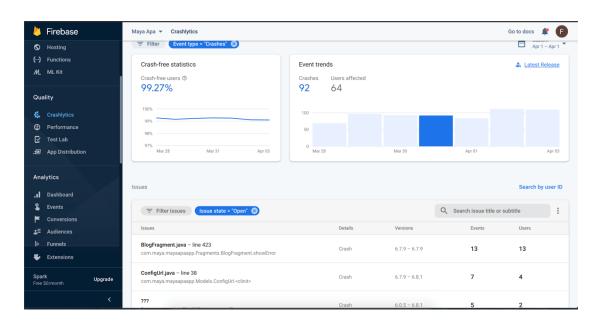


Figure 4.7: High level crash overview

This above screenshot is the firebase crash report of April 1, 2020. Key measuring of this report are given below -

- Percentage of crash free users.
- How many crashes occurred on this day.
- How many unique users were affected.
- Which Classes are affected most.

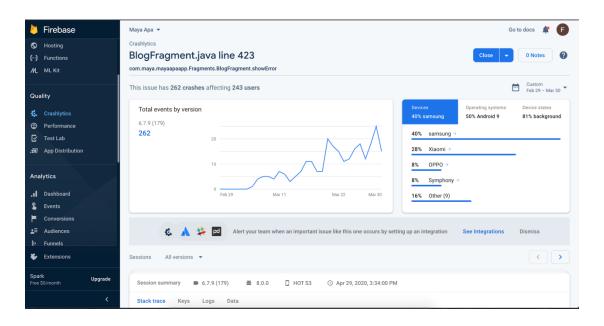


Figure 4.8: Deep level crash overview -1

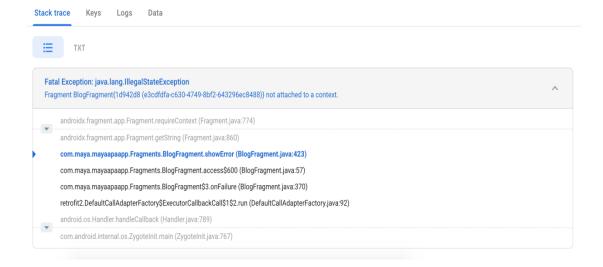


Figure 4.9: Deep level crash overview -2

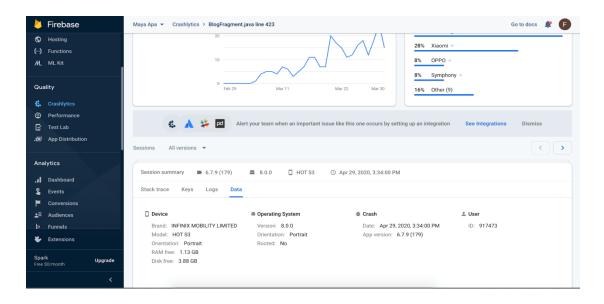


Figure 4.10: Deep level crash overview -3

Above screenshots are showing the details of a specific crash. Key measuring of this report are given below -

- Crash percentage in brand wise.
- It is also showing the function name and line number of the affected code!
- Affected Device's info and conditions.
- App version, User Id

4.4.5 Weekly Maya App and website Tracking by google analytics

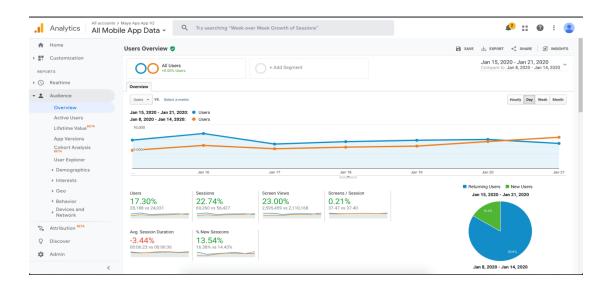


Figure 4.11: Weekly audience data comparison

Above screenshot is flagging a problem that all data of the current week has increased but Avg session duration decreased. So my next job was to find out the reason for decreasing Avg session duration by checking all users' events, pages from analytics. And also by comparing what we have done in last week and current week.

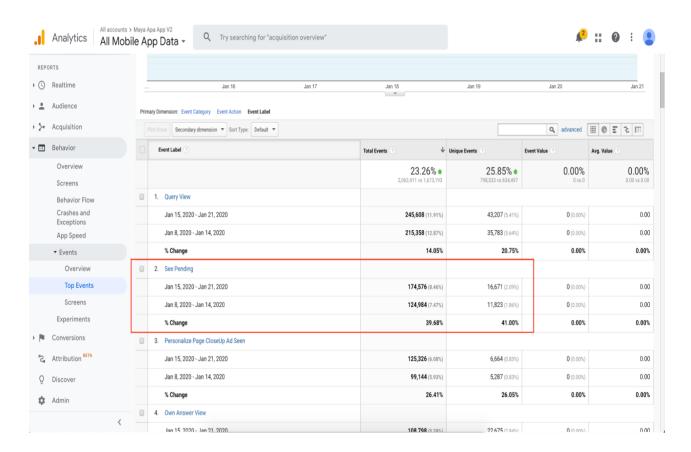


Figure 4.12: Tracked reason of decreasing session duration

After searching in different ways I found the reason for the decreasing session duration. This screenshot illustrates the findings. In the above screenshot showing the "SeePending" event is very high. Actually this event is being tracked when users click to their question those are not answered by the Maya doctor yet. On this week the user increased significantly as a result question also increased with the ratio but doctor was the same as previous. For that reason, a big number of questions were unanswered. So users were opening maya if their question was answered or not. But they became disappointed because their question was yet to be answered. So they immediately exited the app.

4.4.6 Traffic source analysis

```
naya ) 🖿 mayaapaapa ) 🖿 BroadcastReceivers ) 🔞 CampaignReceiver 🔸 🥻 🛎 app 🔻 🖫 pixel 2 API 24 🔻 🕨 🚓 👼 🕠 🐧 👢 Git: 🗸 🗸 🕦 🤚 🗈 😥 🗖 🕞 🕡 🐧 🔘
© PremiumPrescriptionSuccessActivity.java × © MainActivity.java × © CampaignReceiver.java
39
                  timber.log.Timber.tag(TAG).d( message: "Full Intent: " + intent);
40
                  if (intent != null) {
41
                      timber.log.Timber.tag(TAG).d( message: "Bundle from Intent: " + intent.getExtras());
42
                      timber.log.Timber.tag(TAG).d( message: "Intent Action: " + intent.getAction());
43
                          // Make sure this is the intent we expect - it always should be.
                          if (intent.getAction().equals("com.android.vending.INSTALL_REFERRER")) {
45
                              String rawReferrer = intent.getStringExtra( name: "referrer");
46
47
                              timber.log.Timber.tag(TAG).d( message: "Referrer: "+rawReferrer);
48
                              if (null != rawReferrer) {
49
                                  // The string is usually URL Encoded, so we need to decode it.
50
                                  String referrer = URLDecoder.decode(rawReferrer, enc: "UTF-8");
51
                                 source = referrer;
52
                                String campaignData = "http://examplepetstore.com/index.html?" +
53
                                        "utm_source=email&utm_medium=email_marketing&utm_campaign=summer
54
                                        "&utm_content=email_variation_1";
55
                                  // Persist the referrer string.
56
                                  context.getSharedPreferences( name: "referrer", Context.MODE_PRIVATE).
57
                                          edit().putString("referrer", referrer).commit();
                                  Tracker t = ((RecorderApplication) context.getApplicationContext()).getTracker(RecorderApplication.TrackerName.APP_TRACKER);
58
59
                                  t.send(new HitBuilders.ScreenViewBuilder()
60
                                          .setCampaignParamsFromUrl(referrer)
61
                                          .build());
62
                                  sendSourceAndDeviceId();
63
           CampaignReceiver > onReceive()
```

This java code snippet is used for tracking traffic sources in app end.

Analytics **♣**² :: **②** : Q Try searching for "acquisition overview All Mobile App Data ♠ Home Q advanced 🗏 🖰 🗉 🟗 🔠 Audience - 3- Acquisition 34,561 12,967 87,492 00:06:17 \$1,194,00 New Users 9,566 (27.18%) 3,714 (28.64% 20,665 (23.62%) 00:06:10 \$199.00 (16.679 1. (not set) / (not set) App Marketplace 2. google-play / organic 8,880 (25.23%) 3,311 (25.53%) 25,167 (28.76%) 00:06:22 \$796.00 (66.67%) 3. (direct) / (none) ② 8,246 (23.43%) 3,213 (24.78%) 18,821 (21.51%) 00:05:48 \$0.00 (0.00%) 4. website / web 2,949 (8.38%) 1,030 (7.94%) 8,484 (9.70%) 00:07:04 \$0.00 (0.00%) ▶ Google Ads 5. answer_page_app_url / websit 2,053 (5.83%) 901 (6.95%) 5,354 (6.12%) 00:07:07 \$0.00 (0.00%) 6. fbpagepost fahmid / fb 10 (0.08%) 1.538 (1.76%) 00:04:38 \$0.00 (0.00%) 7. facebook use app / facebook use app 647 (1.84%) 170 (1.31%) 1,630 (1.86%) 00:05:42 \$0.00 (0.00%) 623 (1.77%) 204 (1.57%) 1,893 (2.16%) 00:07:01 \$199.00 (16.67%) 9. messenger-bot / facebook 431 (1.22%) 1,117 (1.28%) 00:05:55 Attribution BETA Q Discover Admin © 2020 Google | Analytics Home | Terms of Service | Privacy Policy | Send Feedback

Figure 4.13: Java Code for tracking traffic source

Figure 4.14: App traffic source analysis

Above screenshot shows which source brought how many users. For tracking more deep data like organic and paid traffic mediums we used google google play url builder.

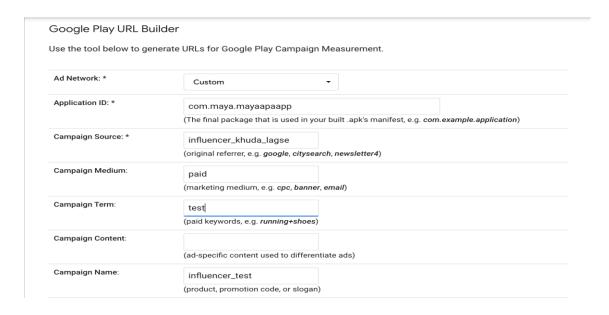


Figure 4.15: App url builder

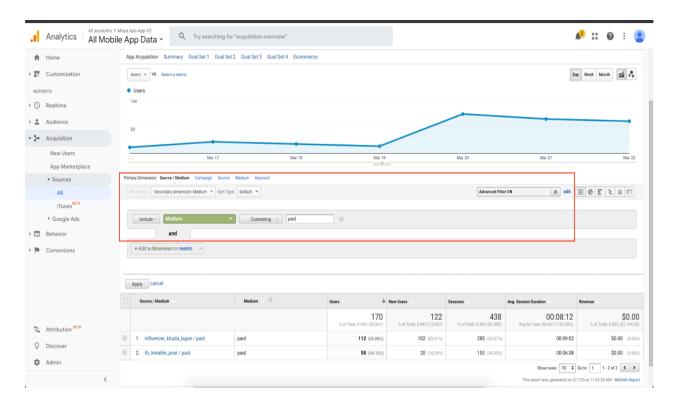


Figure 4.16: Advanced filter for finding paid traffic

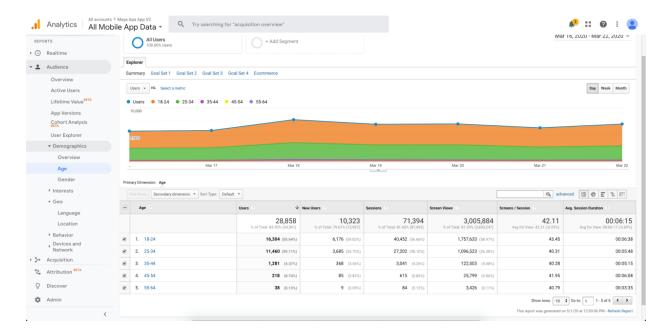


Figure 4.17: Age demographic

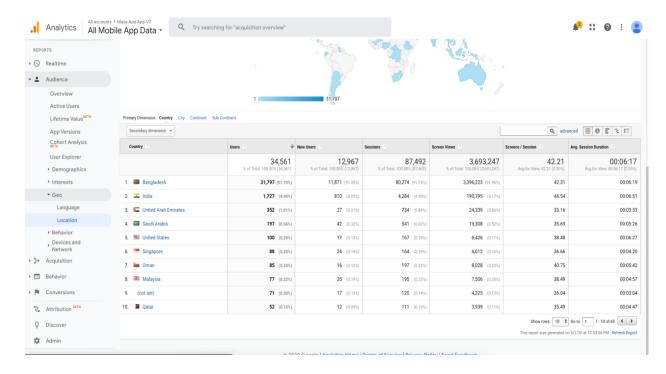


Figure 4.18: Location demographic

Above two screenshots are showing gender and location demographics. We see in the first screenshot the strong user base of maya belongs 18-34. In the second screenshot most of the Maya users are Bangladeshi but users from some other countries are also using Maya.

4.4.7 Exporting weekly user ids of specific segmented users

I am illustrating the custom segment of users who explored the "Maya Period Tracker" Tool from the Maya app. By that user Id Maya takes action like sending personalized push notifications or promo codes and many more.

Step: 1

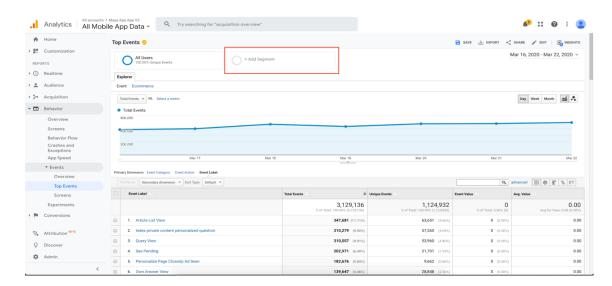


Figure 4.19: Add segment

Step: 2

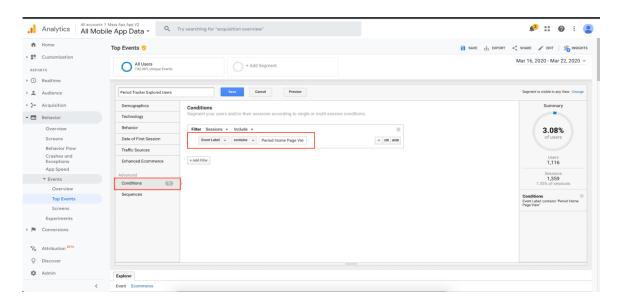


Figure 4.20: Add Condition

Step: 3

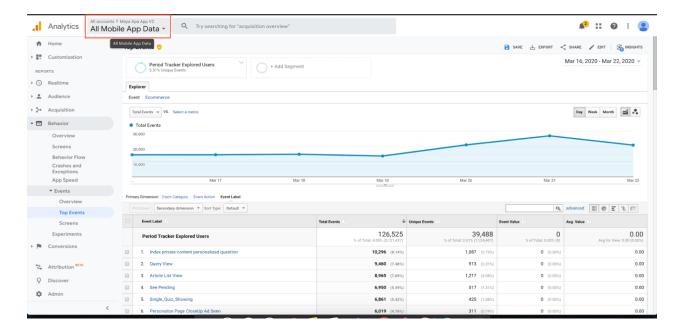


Figure 4.21: Click On All Mobile App Data

Step:4

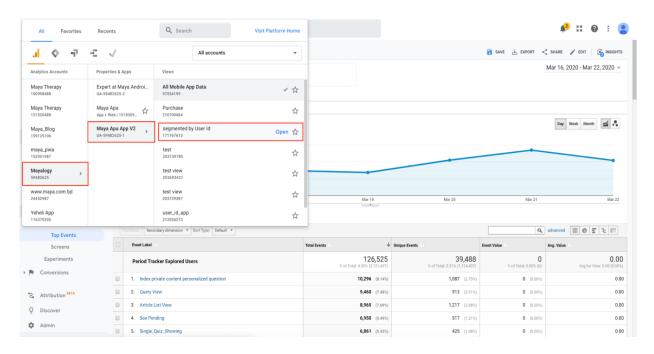


Figure 4.23: Going to the "segmented by user id option"

Step: 5

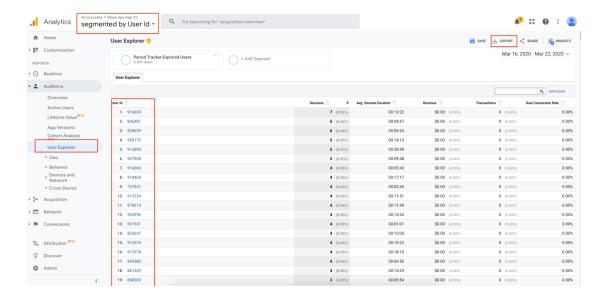


Figure 4.24: Exporting user ids.

4.4.8 Monthly Maya App Tracking

Monthly Retention:

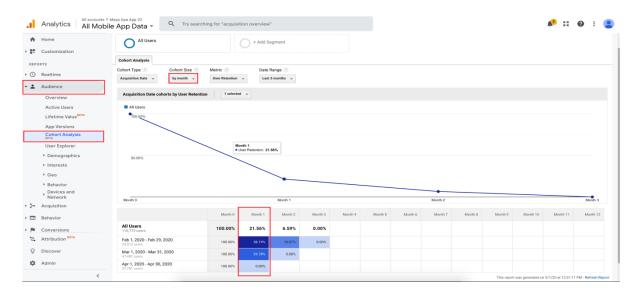


Figure 4.25: Monthly Retention.

Monthly Retention% indicates how many users come to a service from the immediate previous month. It's actually the key measuring number of a service! Market research says average 30 days retention is 27% to 43%.

Tracking new user journey funnel:

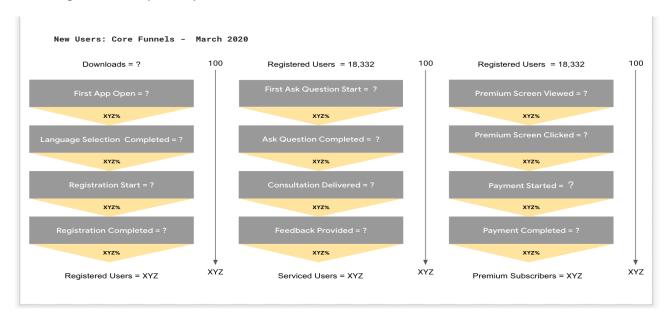


Figure 4.26: Structure of Core funnel of new users.

End of the month my mandatory task was tracking new user journeys. I am explaining those steps how I tracked them.

Step:1

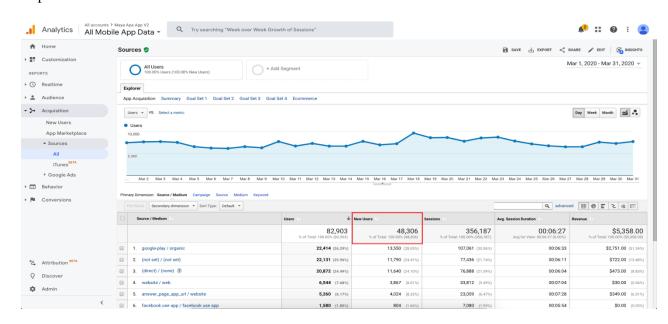


Figure 4.27: New downloads

This above screenshot is showing total new downloads of this month May, 2020

Step: 2

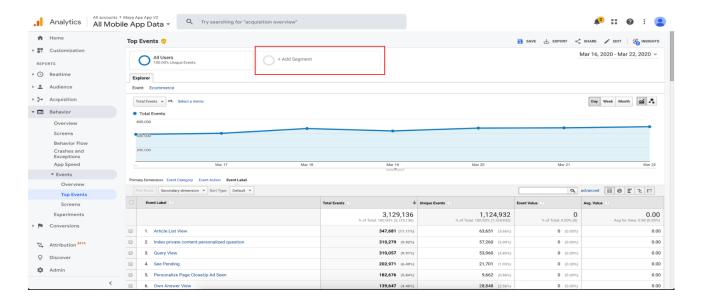


Figure 4.28: Adding New Segment

Above screenshot is showing "Adding New Segment" which is explained in our previous " Exporting weekly user ids of specific segmented users" portion.

Step: 3

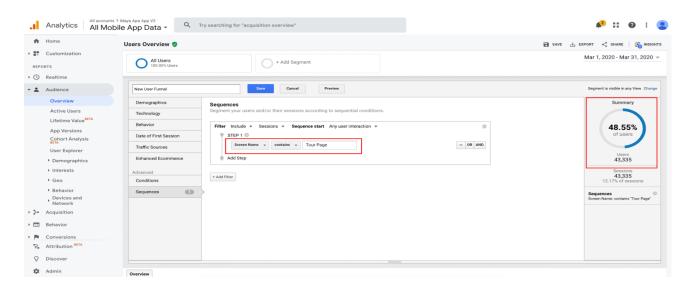


Figure 4.29: Number of first open user

Maya app shows the Tour screen to their new users when they open this app for the first time. And from this page a screen name is being setted named "Tour Screen". So I have tracked this user as considering "First App Open".

Step: 4

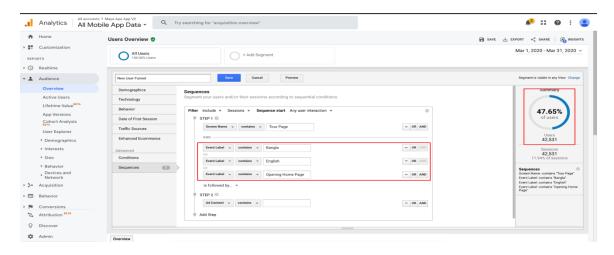


Figure 4.30: Number of languages selected user

Maya tour page has 3 options to select app language. Event name bangla fired when the user clicked to choose Bangla language and English fired when chose English. "Opening Home Page" event fires when the user chooses the default language. So I used Or clauser to track the users who have completed the language selection.

Step: 5

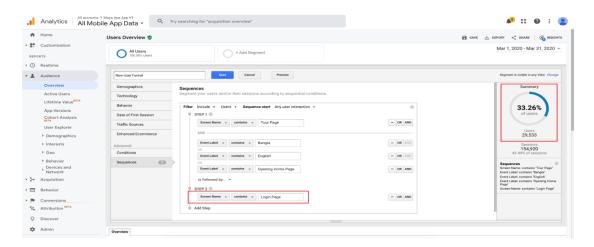


Figure 4.31: Registration start

We are tracking the screen name "Login Page" to find out how many users have started to

Register in Maya. It should be a Register Page, but registration and login flow is exactly the same. So in both cases users see the same Screen.

Step: 6

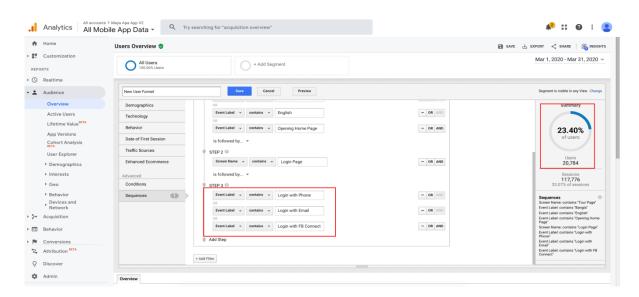


Figure 4.32: Registration Completed

Maya has 3 login/registration options. So I have enclosed all the three events to find out the total number of registration complete.

Step: 7

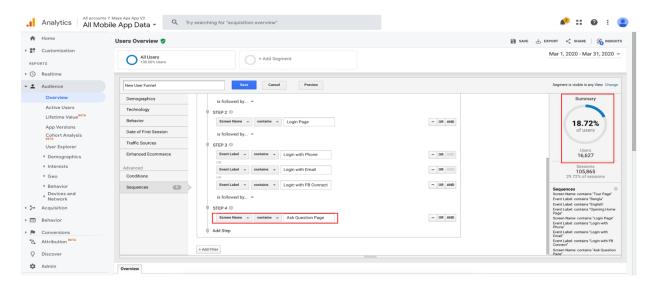


Figure 4.33: Question Started

The Ask question page of Maya is tracked by a screen name "Ask Question Page". When an user comes to the page this page is being tracked.

Step: 8

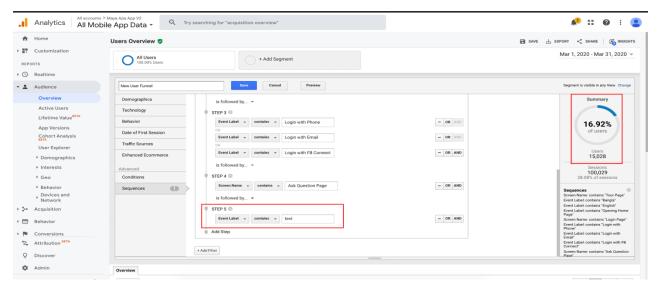


Figure 4.34: Ask Question Completed

The Ask question event of Maya is tracked by an event named "text". When a user comes to the page ask page and successfully asks a question then this event is being tracked.

Step: 9

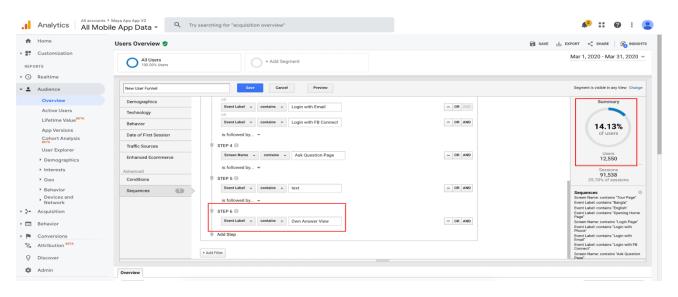


Figure 4.35: Consultation Delivered

In Maya an successful consultation is considered when an expert answers a user question and the answer is seen by the questioner. This event is tracked by "Own Anser View".

Step: 10

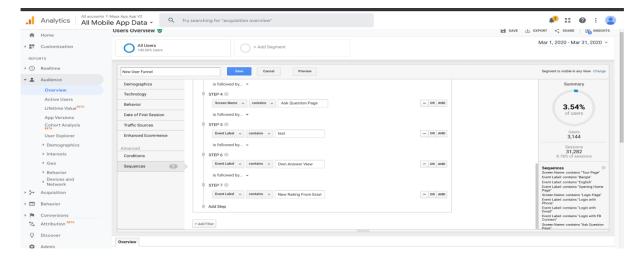


Figure 4.36: User Feedback Provided

Step: 11

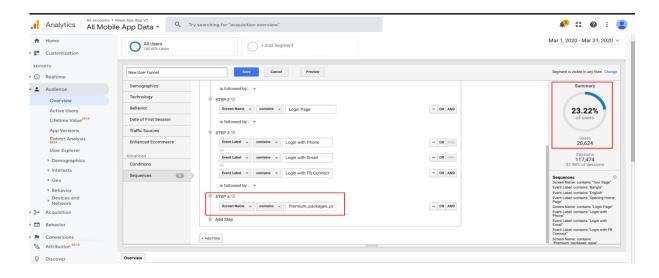


Figure 4.36: User Feedback Provided Figure 4.37: Premium screen viewed

Maya has a premium feature named "Maya Plus". Above screenshot showing how to track the visitors of that screen.

Step: 12

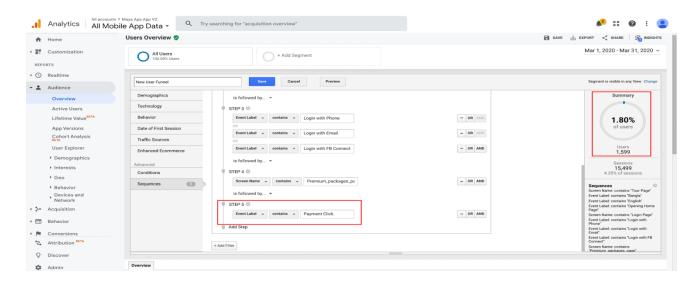


Figure 4.38: Premium screen clicked

Above screenshot shows how to track the leads the user show clicked to pay from the Maya Plus screen.

Step: 13

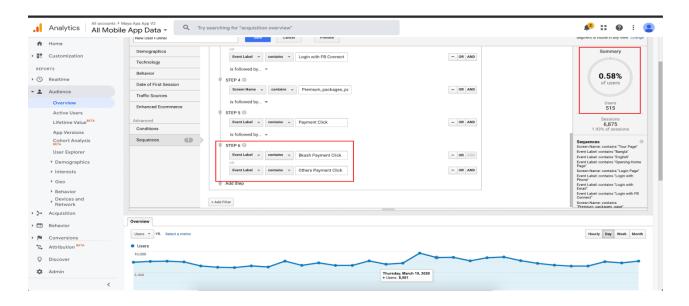


Figure 4.39: Payment Started

Maya has two options for payment. One is Bkash and another is Portwallet. So I enclosed these two events to track who was on the payment page.

Step: 14

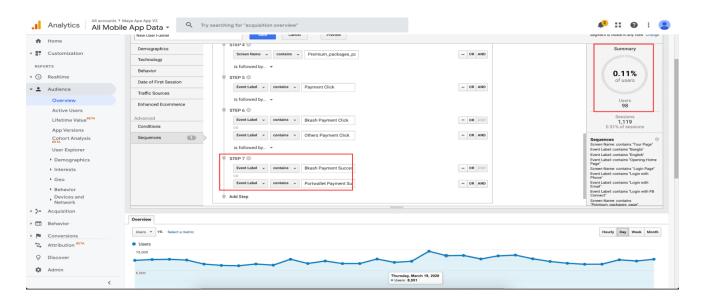


Figure 4.40: Payment Completed

Final view of new user journey funnel



Figure 4.40: Payment Completed

Figure 4.41: new user journey funnel

Above screenshots showing a clear picture of Maya new users. We can see here the First goal conversion is showing good numbers as a percentage of total new users. Second goal conversion is also fine. But the third one (Subscription), goal conversion is very low.

User behaviour flow

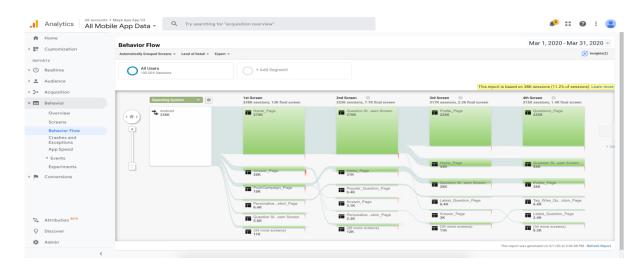


Figure 4.42: User behaviour flow

This screenshot is showing screenwise user dropping as percentage. Screenwise user dropping means which users are exiting from which screen of the app.

Exploring user journey by Mixpanel analytics

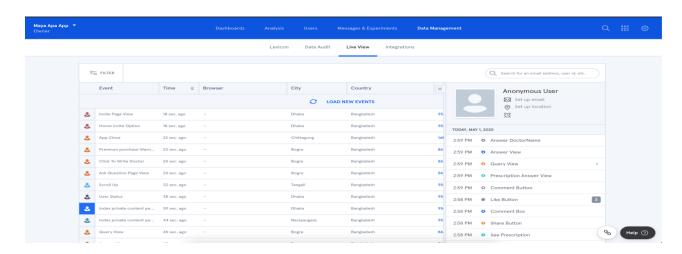


Figure 4.43: User engagements in app.

Above screenshot showing the user engagements in a very sequential way. It's very helpful to see a specific user journey deeply.					

CHAPTER 5

Conclusion and Future Career

5.1 Discussion and Conclusion

It was a really great opportunity to work in Mayalogy Ltd. as an analytics manager Intern. Big user base of Maya helped me a lot to learn about user behavior. Along with my technical knowledge I learned here how to work as a team for a specific goal. I also got an overall Idea of an organization like how they operate, how they act. Before joining Maya I was always worried about working with talented and high authority people. But I was wrong, actually they are normal people like us. They hold their position for their experience, hardwork and patience. My best realization was that communication skills play a big role In a organization.

5.2 Scope for Further Career

Lots of local and international startup businesses and E-commerces have started their business in Bangladesh now. This number is increasing day by day. Along with that DIgital marketing also takes lots of budget instead of traditional offline marketing. Without analysing user data and behaviour it's quite impossible to run an online business. That's why companies are building their own Analytics and User Experience team.

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Appendix A: Internship Reflection

Basically I had two options for Bsc requirements. One is an internship and another is project work. I had chosen an internship rather than a project because I wanted to work in a company with a real world project. And I also thought that It will help to grow my professionalism.

As for my Internship I chose Maya because it's a growing and challenging startup. They are solving real world problems like Health. We all know as a developing country we are struggling in the health sector. Maya helps thousands of people by consulting their physical and mental health issues daily. I am very honored to become a part of Maya's contributor list.

Appendix B: Company Details

Mayalogy Ltd. began their journey in 2011. At the beginning they had raised 40 million dollar

from The reputed organization Brac. After that they were helped by the Ict division two times.

After that they go for partnership with ACI company. They also got help from some reputed

International program like Google accelerator program and spring acceleration program. They

had 100+ experts (Doctor, Psychosocial, Beautician) who are giving thousands of consultations

daily through Maya app and website. Mostly its service is free. They also working with some

garments Industry to help their employee by a serviced named "Kiosk".

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