



EVENT-BASED ANALYTICS

OF LARGE SCALE WEB BASED PLATFORMS

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INTRODUCTION

End-user platforms have evolved rather rapidly over the past few years to be highly dynamic, haptic-feedback friendly, and have challenged the conventional notions of analytics: clicks, page views and other metrics typically used for websites of the yester-years.

However, tools that are rooted in conventional ideas are still in vogue: Google Analytics is one such tool that bases its basic analysis on page-views and aggregated metrics that renders it inflexible. It requires pre-designing of funnels, does not provide an easy way to track users by identifiers used by an application, isn't intuitively geared towards tracking different abstractions of content organization or behaviour, and cannot indefinitely store data for retroactive analysis.

In this paper, we investigate the shortcomings of this paradigm and Google Analytics in particular, explore MixPanel as a new alternative to tracking user behaviour with fine-grained event data, and finally the advantages and possible challenges using this alternative.

GOOGLE ANALYTICS & MIXPANEL

Web analytics platforms track metrics pertaining to the users and their behaviour on a web application and store them in a form that facilitates reporting, optimisation of content, and interaction with users. Google Analytics and MixPanel are two popularly used web analytics platforms.

Google Analytics (GA) is an older, mature platform that provides capabilities to track page visits, views, and actions on a webpage, smartphone app, or any user interface and consequently generate reports that slice and dice these metrics. It is rooted in traditional notions of a website or a web application being a collection of pages. While it does support various other abstractions such as events and funnels that makes business sense, using them requires some effort and is at times inflexible [1][2][3]. A lot of the features of GA are available for free and therefore are by default, used in all web applications. Premium features exist and are usually sold through resellers through a fixed-term license.

Steps	Google Analytics	MixPanel
STEP 1: Account setup and App profile creation	<p style="text-align: center;">Create unique tracking ID</p> <p style="text-align: center;">Place code on website, app or UI</p> *Tracks default GA Metrics *Default GA user model	
STEP 2: Customisation	Define custom events Define filters, goals and funnels	Identify events and context to track Define user model
STEP 3: Configuration & Deployment	Hacks and custom code to track events	Client side JS or server code to track events, users and context
STEP 4: Data Collection		
STEP 5: Reporting and actionable insights (iterative)	Create/view reports based on fixed time window and existing filters, goals and funnel definition Reports on users (aggregate)	Define and create filters, goals and funnels Reports based on events and context Targeted notification or communication through push, sms, email or web Reports based on users (aggregate and individual)

Figure 1: Workflow of a typical GA and MP solution. While GA offers a default option that works for conventional websites, MP offers greater flexibility by bringing most of the design elements into Step 5 (Reporting). The brown boxes are managed by the service (GA or MP). Orange boxes indicate optional and White boxes indicate compulsory actions respectively

MixPanel (MP), like Google Analytics, can be used to analyse users and their behaviours in an application. However, it approaches the problem of tracking traffic and behaviour through the notion of “events” that are tagged with properties that describe the context of the event, including the user. The explicit marking of properties combined with features such as a support for various data types for properties, lends itself naturally to a power dashboard that is intuitive, retroactive, and flexible.

This advantage comes at a cost: the application developer has to now understand the goals of analytics, define events that track such goals, and write code to track the events (and provide the required context). Furthermore, MP charges a dollar for 10,000 events as of writing this document with bulk discounts. Therefore, it also becomes imperative to optimise the tracking of events to the most relevant ones.

In addition to the differences between GA and MP described above, MP focuses on tracking individual users and therefore also provides the necessary dashboard to target notifications or messages to “user segments” of an application [4].

ADVANTAGES OF MIXPANEL OVER GOOGLE ANALYTICS

Most of the features of MP can be implemented with GA albeit with extra effort or hacks [1]. Based on our reading, some focus areas of MP that render it better than GA because of its ease of use, are given below.

1 EVENTS AS FUNDAMENTAL UNITS OF BEHAVIOUR

MP relies on events and their context to generate reports. This is more intuitive than page-views and clicks that GA by default relies on, and extends beyond web apps to mobile apps, embedded platforms etc. GA does provide support for events but its use is more convoluted than it is in MP.

2 ADVANCED REAL-TIME TRACKING

MP allows real-time reporting based on events, their properties, and user profiles and is more advanced than the basic Real-time tracking offered by GA.

3 RETROACTIVE ANALYSIS

MP stores data points for quite long duration of time (up to 3 years, in the case of paid users) that allows for retroactive analysis. Funnels and filters can be created after the data has been collected, which turns out to be a huge advantage.

4 BUILT-IN RETENTION ANALYSIS

MP provides built-in support to track retention which requires a bit of effort on GA [5].

5 DETAILED SEGMENTATION & REPORTING

Given MP's ability to handle multiple data types (numbers, dates, and strings) and the ability to store detailed context of an event and information pertaining to a user, segmentation and reporting abilities of MP are supposedly more useful than those in GA.

6 INTERFACE FOR A/B TESTING

MP has provided specific features for A/B testing of the features of an application.

7 ABILITY TO USE OWN DISTINCT ID

MP allows developers to mark unique users by an ID that matches with their application's database, which allows for a more integrated and accurate solution (refer to the alias method in [8]). Interestingly, using MP's in-built ability to identify distinct users has led to incorrect analysis and has been discussed in literature [6][7]. GA does offer the ability to add user-ids (and use them for analysis), while not being an exact replacement or having the flexibility of the MP's alias method.

8 INTERACTION WITH USERS

Users can be tracked and communicated with through the MP notification system, (SMSes, push notifications, or webhooks)

9 THE FINE PRINT

MP claims to not use the data collected from a customer for any purpose other than serving the customer (unlike GA that uses the data collected to improve ad revenue). The customer support of MixPanel seems to be better than that of GA.

10 LANGUAGE SUPPORT

MP provides wrappers and libraries in various languages like Java, Python, PHP, Ruby, JavaScript, etc. thereby offering a great deal of flexibility in developing solutions.

ADVANTAGES OF GOOGLE ANALYTICS OVER MIXPANEL

1 PROGRAMMING AND DESIGNING EFFORT

Decision of what events are to be tracked have to be made in advance (although funnels can be defined retroactively). This issue, for example, has been offset by HeapAnalytics [9].

2 EASIER ALTERNATIVE FOR CONVENTIONAL SITES

GA easily tracks traditional websites that still stick to the notions of pages & links between them.

3 COMMUNITY OF EXPERTS

GA has a strong community support and therefore, expertise readily available in the market which MP lacks.

4 VARIABLE COSTS

MP costs are variable and increases with traffic and the granularity of behaviour tracked in an application: GA is available for free and the premium license costs a fixed amount. Therefore, the granularity of tracking events and expected traffic have to be factored into the economics of choosing GA and MA

CONCLUSION

Preliminary research of the two tools show that they have a good overlap of features but approach the problem of analysing traffic through different paradigms: GA through the conventional notions of website analytics and page views, and MP through “events”, “users”, and “context” as abstractions which generalise to user interfaces and platforms that have the ability to record behaviour. GA offers a free (or a fixed-price GA premium solution) as opposed to MP, whose cost is a function of the traffic and granularity of data collection. Familiarity of using GA, ease of carrying out different kinds of analysis on GA and MP, and the overall flexibility offered by MP, and the non-interfering nature of these services point towards using both of these services, wherever possible to derive the best of both of the tools.

From a the perspective of conducting analysis at different stages of a marketing funnel, GA and MP eventually offer sufficient functionality for analysis. MA could be more accurate due to the precision with which users can be sampled as compared to GA. However, Both, GA and MA offer similar depth-of-analysis for acquisition, activation, retention, referral, and revenue. However, certain features pertaining to retention and cohort analysis, can be carried out more flexibly and easily in MA [11][12].

Lastly, the great deal of flexibility and generalisability of abstraction offered by MP is traded off with the effort of defining and capturing events in a system: This requires a structured process and “a checklist” that ensures that the metrics are directly relevant to business outcomes are captured and analysed.

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