

Application of growth hacking methods in the promotion of mobile applications

João Nuno Alvim Leite Terra Figueiredo

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Orientador na FEUP: Prof. Bernardo Almada-Lobo

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List of Acronyms

CPI	Cost per install
CPMM	Cost per 100,000 impressions
PPV	Pay per view
FYP	For you page
POV	Point of view
US	United States
ROI	Return on investment

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1. Introduction

In this chapter the content and motivations of this thesis are introduced, an overview of Dandy and TTYL is presented and finally, the objectives and organization of this dissertation are discussed.

Dandy and TTYL are two companies that create social apps. This dissertation will analyze the growth hacking campaigns developed for both companies.

1.1 Content and Motivation

Since the 1992 invention of the SMS in the United Kingdom, mobile marketing and advertising have shown an upward trend. In recent years, marketing and advertisement agencies have moved to apps to have a more organic and personalized reach. Several factors have contributed to the ascent of mobile apps, such as cheaper internet, globalization, and in more recent times, a global pandemic. By 2010, in an interview conducted by Google, 89% of all interviewees reported having used their mobile phones during the day, while 68% reported having used an app (Rakestraw et al., 2013). Respondents used these apps primarily for shopping. Some of the largest market holders are Apple and Google, and they run app stores depending on a user's operating system. Mobile apps have had varied success, with some leaving the market in totality, such as Vine and Myspace. Snapchat, Facebook, Instagram, WhatsApp, and TikTok are currently the most-used apps. Social apps growth in Europe went up by 4.32% and 6.96% in America between 2019 and 2020 (Dean, 2021). Figure 1 shows the difference in app downloads from 2019 to 2020 in both the Apple App Store and the Google Play Store.

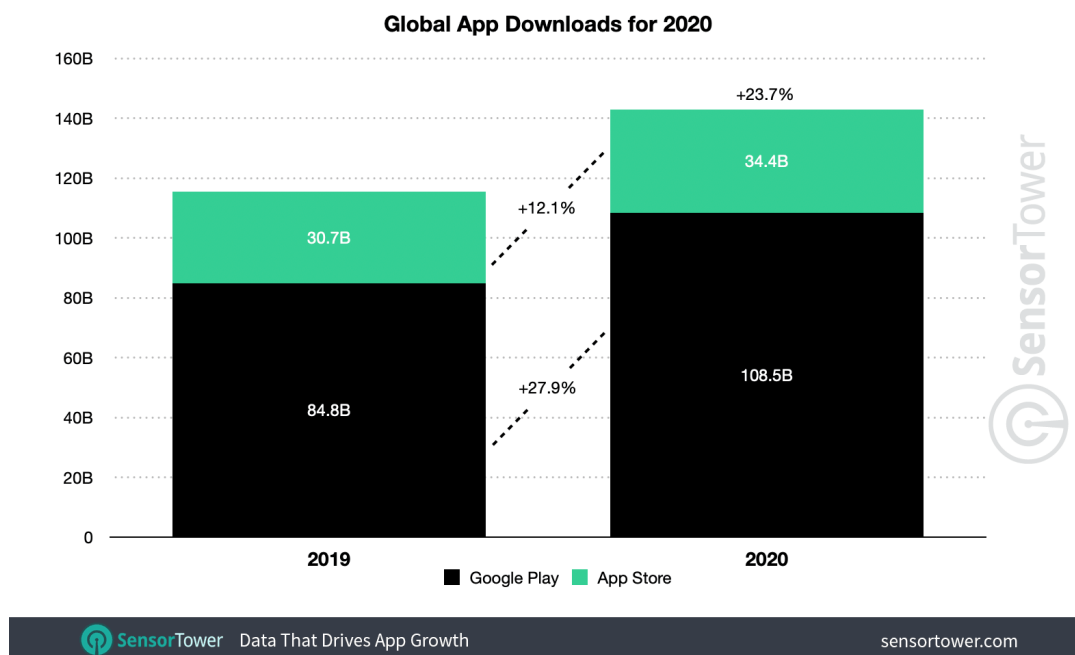


FIGURE 1 - GLOBAL APP DOWNLOADS FOR 2020

In the fore years, apps quickly gained downloads because there were considerably fewer apps. The apps seemed to fill different niches, but recently there has been an avalanche of apps. Numerous apps now perform the same task, and thus, there has been a depression in the ease of organic reach due to the increase in the number of options available. Across all platforms, app store downloads are estimated to be about 250 million in a day between 2019 and 2020 (W, 2021). The influx of new apps has forced companies to increasingly rely on marketing efforts for app growth. Growth hacking and growth marketing have been used to boost initial adoption of apps.

In contrast with conventional marketing, growth hacking leverages the product's particularities to find unique promotion strategies. Growth hacking strategies perform exceptionally well when applied to social apps, since these exhibit a more substantial product led growth due to networking advantages. Growth marketing has edged out conventional marketing because it has focused on user journey and activation, even after the acquisition.

An overview os the two companies analysed in this dissertation is done in the following sub chapters.

1.2 Dandy Overview

Dandy, founded by two University of South California students, is a dating app that targets university students who fancy the idea of live speed dating. The company raised 3.3 million dollars and was backed by Tinder's Chief Technology Officer and the executives from Snap, Facebook, Uber, Airbnb, and Lyft, among others.

The Dandy app goes live at 8 pm, and all active users are expected to swipe left or right on other user's profiles, to express interest or lack of it. Two users who match are moved to a live chat for 3 minutes before deciding to continue or end the conversation. Those who opt out are redirected back to swiping. During the global pandemic, Dandy has taken advantage of confinement measures to offer a sense of ordinary life to college students. Dandy pivoted to Zoom University to introduce the world's first virtual party where everyday at 8pm, users along with their selected friend are paired on a 2:2 video chat with two random friends in the US from the opposite gender. Zoom University accumulated over 125,000 registered users, and reached top 9 in the Social Networking category on the United States App Store.

1.3 TTYL Overview

TTYL was founded by two UCLA (University of California, Los Angeles) alumni and brothers that raised 2.0 million dollars from Floodgate, SV Angels and Shrug Capital. The TTYL app is an exclusively audio social network that allows up to seven friends to hang out even if they are far apart. The app allows people to join in on already running conversations to create a natural conversational environment.

TTYL pivoted to an app studio that sought to launch multiple apps targeting high school and college students. The apps used a concept validation strategy where every app, whose development cycle ranged from 2 to 3 months, focused on a core question that wanted to be answered or tested. TTYL successfully managed to launch five apps in a single year.

Poparazzi is the latest app launched by TTYL. The app requires a user's profile to be created by their friends, and therefore photos can only be posted to other user's profiles, not their personal one. Poparazzi aims to redefine the relationship teenagers and young adults have with social media, and create a safe and authentic space on the internet. Poparazzi has accumulated over 500,000 pre-orders from AppStore, and reached the number one spot on the US AppStore on the day it launched. According to Forbes (Konrad, 2021), TTYL reached a valuation of as much as \$135 million, just days after launch.

1.4 Objectives

The main objective of this dissertation is to find a strategy to promote social apps on TikTok that leverages the artificial intelligence algorithm to achieve virality, describe its implementation and proceed to evaluating its efficacy.

1.5 Organization

Following this chapter, the document will be structured in the following manner.

Chapter 2 will go over the background in which the thesis is involved. Firstly, generation Z is described, along with its consumer habits and an analysis on how Generation Z shapes the consumer markets. Secondly, the mobile app consumer market is presented, along with its trends. Thirdly, the marketing channels and strategies for the promotion of mobile apps are listed. And finally, a brief description of cohort analysis, regression analysis, A/B testing, and qualitative and quantitative data, are done.

Chapter 3 will focus on the problem description, where the context of the problem is presented and relevant information surrounding its particularities is presented. It includes an overview of the factors that influence campaign strategy, the performance metrics used as campaign KPIs and context around advertising on TikTok.

Chapter 4 focuses on the marketing campaign for the app Zoom University. The chapter starts by going over the campaign strategy and how it evolved, it is followed by a in-depth analysis of the campaign variables and its effect of the overall performance of the campaign. The methodology of the analysis will be outlined as well as its results, conclusions and next steps.

Chapter 5 does an overview of the campaign for the app Poparazzi, where the learnings from the Zoom University app campaign were leveraged. The results from that campaign are analysed and conclusions are extracted.

Chapter 6 includes the future work and conclusions. In this chapter the possible next steps in the analysis will be outlined and a critical reflection about the dissertation will be done.

2. Background

2.1 Generation Z

This subsection is dedicated to describing the Generation Z consumer and how they make decisions, what matters to them and how they shape the market. Since Generation Z is the target user demographic for the majority of social apps, it is important to understand their context and motivations.

Generation Z Overview

Generation Z lacks a clearly defined range of years. However, most sources agree that they are born between 1996 and 2010 (Strauss & Howe, 2008). This demographic cohort follows that called the Millennials. The dates remain open to re-calibration (Result, 2020).

Generation Z, sometimes fondly termed Gen Z, has been affected by significant global occurrences such as the September 11 terrorist attacks and the global recession (Turner, 2015). Going by the time frame, Generation Z individuals have no clearly defined memories and experiences of the 9/11 attacks and thus have lived in a nation that has known war, as far as they can remember (Result, 2020). The global recession of 2008 has been instrumental in informing Generation Z's general life, primarily because it was in their childhood and formative years (Turner, 2015). Student debt, entrepreneurial desires, and the affordability of college education are among the top concerns of Generation Z. Generation Z is the savviest generation due to exposure to technology from a young age (Prensky, 2001).

Generation Z has lived surrounded by technology. For most Generation Z, early life for the preceding millennials is almost inconceivable, almost like a far-fetched fable. Generation Z has fully lived within the beauty and ills of globalization and is virtually connected all the time. According to a survey conducted by Palley (2012), 90% of Generation Z would be upset about having no internet connection as a form of punishment (Turner, 2015). Most of them have been born and raised in cities and exposed to cultural perspectives (Turner, 2015).

The boom of the internet, weighed down by untold freedom and global setbacks, makes for a curious inquest into Generation Z consumer behavior.

Generation Z Consumer

Generation Z spends most of their waking hours online, whether working, studying, socializing on social media, and getting entertained through movies and content from content creators. On cue, businesses have moved aggressively towards the internet to woo these particularly avid shoppers with perks such as online shopping and door-to-door delivery. This is in tune with popular notions that Generation Z is lazy and addicted to smartphones (Grigoreva, Garifova & Polovkina, 2021).

These services range from food to online games, clothes, trendy shoes, among other products. Generation Z are, therefore, able to seamlessly live while still in the social bubble. Generation Z is exposed to tons of information about products, including reviews, advertisements, or endorsements from influencers and bloggers. Consequently, Generation Z makes more highly informed, pragmatic and analytical decisions than any other generation (Grigoreva, Garifova & Polovkina, 2021).

How generation Z is shaping the consumer market

At the moment, Generation Z comprises young adults who may not have a lot of responsibilities. At the same time, they are old enough to enjoy an extensive degree of freedom, money, and credit card usage. According to Forbes, Generation Z's direct and indirect spending power reached \$143 billion (Raynor, 2021), an attractive figure that has brands running over each other to dominate. Thus, advertisements have been curated to suit the need of a generation exhibiting impatience and fragmented attention to short, flashy videos.

Some brands have gone a step further to involve Generation Z consumers in advertising. Brands such as Starbucks, where customers buy a coffee, snap a photo, send it to Starbucks, and Starbucks posts the photo asking their followers to follow the original owner of the photo (Grigoreva, Garifova & Polovkina, 2021).

Brands have also made use of influencers and celebrities who command large followings to influence Generation Z in their favor and increase their conversions, even in the middle of a global COVID-19 pandemic.

Angela Woo of Forbes advises companies to consider technology shifts by creating user-friendly websites and apps to make the online experience enjoyable for Generation Z and assure brand loyalty (Woo, 2020). Generation Z's nature as "psychographically" diverse in terms of culture, race, sexuality, beliefs, body types, and gender demands that brands be more inclusive in their advertising and production lines (Woo, 2020). Neal Sivadas explains that Generation Z has the shortest attention span of any generation in history, and brands must therefore leverage on the span of 8 seconds and leave a lasting impression (Sivadas, 2020). He further explains that YouTube, being the most used app by Generation Z, provides more action-packed content and instant gratification (Sivadas, 2020). Lisa Kalscheur explains that Generation Z shoppers are shopping with a heavy influence of social views, increased advocacy for environmental sustainability and diversity, and therefore gravitate towards brands with clear stances in line with the beliefs (Kalscheur, 2021).

2.2 Mobile Application Market Overview

This subsection is dedicated to the description of the mobile application landscape, as well as the prediction of its trends over the coming years. Since the applications covered in this document are only available in the Apple App Store, we will be focusing on that mobile application market.

2.2.1 Mobile apps market

Apple mobile application ecosystem involves all the devices and applications that are currently offered by Apple. A study conducted by at Analysis Group by independent economists revealed that the highest value categories were mobile commerce apps, digital good and services apps and app advertising. Apple CEO described the App Store as a place where innovators can bring

their ideas to life as well as a place where users can find secure and trusted tools to improve their lives (Apple App Store, 2021). The App Store provides immense opportunities in many industries, for example: entrepreneurship, education, health and job creation (Capatina et al., 2020).

In the recent years, there has been an influx in the number of mobile apps in the market. Apple launched its App Store in 2008 with only 500 apps available to its users. The App Store enabled any developer with a mobile business idea to create and share Apple App Store apps with ease to reach their target audience. This improvement gave Apple a better chance in the competitive market by increasing its daily active users (Siddhartha & Jagdale, 2018). App Store had more than 3,000 apps available within the first two months after its launch and over 100 million downloads within that period. The most popular apps with app store users in the first year of its launch were: Pandora Radio, Facebook, Tap Tap revenge, Shazam and Labyrinth Lite Edition. Some of these apps have lost their grip in the market while others such as Facebook are still highly popular in 2021 (Apple App Store, 2021).

In the year 2009, the App Store had recorded a significant growth rate with over 35,000 apps and 1 billion downloads compared to Android apps with 2,300 apps available (Apple App Store, 2021). Apple also made numerous significant improvements such as: the launch of iOS 3.0 operating system with improvements in text management, the ability to send push notifications from dormant apps which allowed instant messaging apps to send notifications upon receiving messages (Pötzsch, 2017). The launch of iOS 4 in 2010 brought increased home screen visibility for apps and a new monetization platform - iAd - which increased App Store revenue by helping apps generate over 1,000 million dollars. Despite the steady growth of App Store, Google Play overtook it by 2013 in terms of users and downloads (Apple App Store, 2021).

2.2.2 Trends in the mobile apps market

Over the past five years, Apple has recorded significant evolution in its apps. In 2016, Apple launched its own ad platform, Apple search ads, which allowed developers to promote their apps in search of generic brand or competition keywords and top charts (Capatina et al., 2020). Apple also launched a new operating system for its devices, the iOS 10 which included a new design for the Help Center, maps with advanced information, and improvements in the keyboard. Apple also deleted over 50,000 outdated apps from the App Store (Apple App Store, 2021). In 2015, Apple updated its search algorithm that made it possible to answer reviews that were given from users directly from App Store Connect. The launch of iOS 11 was also achieved during this year. This new operating system allowed users to discover new apps inside the App Store with features such as featured apps of the day. Between the year 2018 and 2019, the famous iOS 12 and iOS 13 were released (Capatina et al., 2020). This period also marked the change of structure of the on metadata fields that enabled the app to rank:

- The app name
- The subtitle
- The promotional field
- The keywords field

Apple Arcade was launched and a new section separating games and other apps was introduced. In the year 2020, the App Store provides apps that are more customized for every user, leaving behind the static interface where all users see the same information. New categories for apps such as developer tools and graphic designs were developed (Apple App Store, 2021).

A good example of the developments in mobile apps is the development of the Clubhouse app. This app is an invite only social media app for iOS that facilitates communication through rooms that can accommodate about 5,000 active users. The app uses audio to host drop-in virtual rooms that enable live discussions conducted by speakers and listeners (Capatina et al., 2020). This app provides a moderated environment hence is less disorganized and highly productive. Clubhouse offers a good marketing platform for corporations as it allows business entities to network with others in the related business fields. It can give access to experts who would usually be out of reach in a physical environment. With the Covid 19 pandemic, Clubhouse is an essential marketing and learning tool for businesses as it does not require physical contact (Strielkowski, 2021).

Future Trends

Mobile apps are expected to undergo extreme developments in future years in order to remain competitive in the digital world. The need for developments on app technology has been fueled by the COVID-19 pandemic that hit the world in 2019 (Apple App Store, 2021). With the introduction of edge computing, a further improvement to cloud will be embraced. This will move the cloud near the user by processing some of the user's computational needs locally or using the nearest station (Capatina et al., 2020). Another expected trend is the advancement of mobile payments, this will provide contactless payments as more businesses integrate them into their systems (Strielkowski, 2021). Given the current world situation, battling a pandemic that mainly spreads through physical contact, it's important that mobile payment is adopted (Capatina et al., 2020). Mobile payments will also improve business as people can pay for products with their mobile phones as opposed to paying through bank cards (Strielkowski, 2021).

Figure 2 and 3 present Sensor Tower's forecast until 2025 for spending and installs respectively. (5-Year Market Forecast: App Spending Will Climb to \$270 Billion by 2025, 2021)

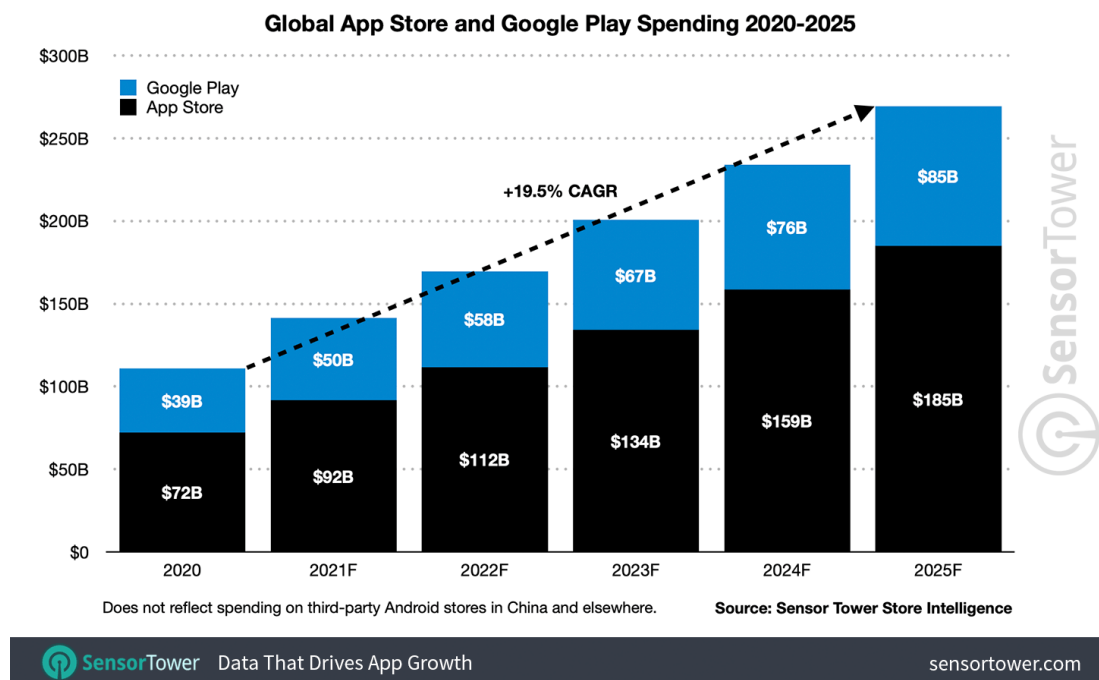


FIGURE 2 - GLOBAL APP STORE AND GOOGLE PLAY SPENDING 2020-2025
(5-YEAR MARKET FORECAST: APP SPENDING WILL CLIMB TO \$270 BILLION BY 2025, 2021)

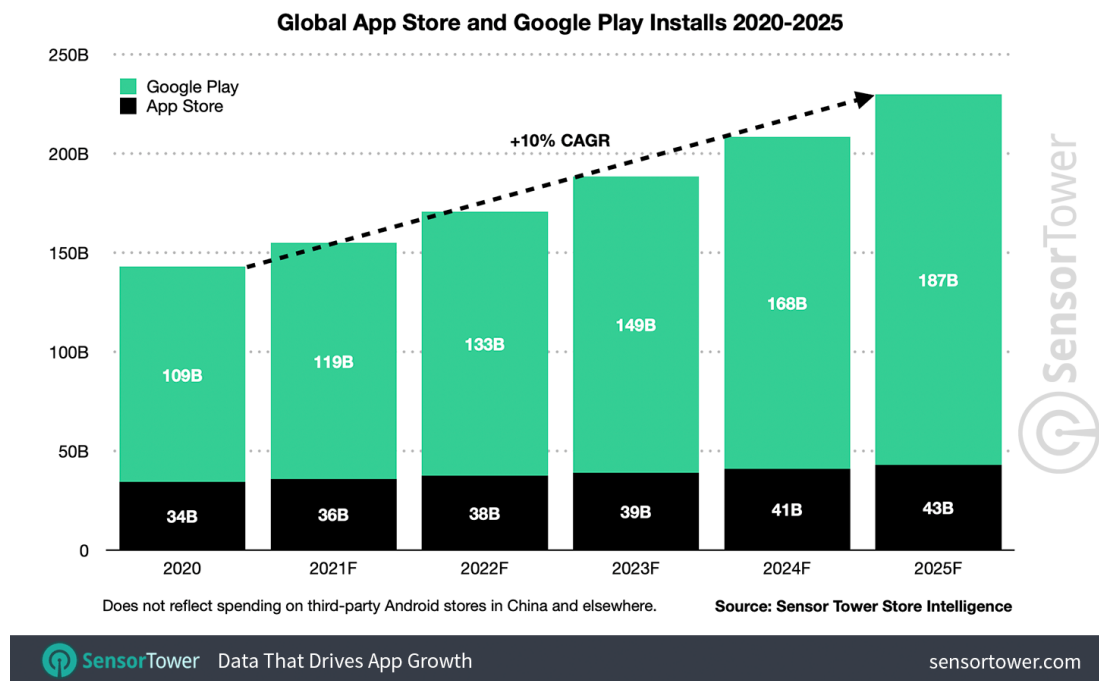


FIGURE 3 - GLOBAL APP STORE AND GOOGLE PLAY INSTALLS 2020-2025
(5-YEAR MARKET FORECAST: APP SPENDING WILL CLIMB TO \$270 BILLION BY 2025, 2021)

2.2.3 App metrics

Retention is the percentage of users who continually stay with an app over a given period after installing. Retention rate is calculated by dividing the number of users, at the end of the time frame, by the number of users at the beginning of the time frame. The churn rate is the number of users who leave or stop using an app within a specified timeframe (Mobile App Retention Rate - Whats a Good Rate & 8 Strategies, 2020).

Download density refers to the number of downloads in each geographical location, for instance, in a city or a university.

2.3 State of the art of mobile app promotion

According to Geenapp, a mobile app marketing company, the average cost per install is \$0.44 for iOS apps and \$0.86 for Android apps (Dogtiev, 2021). Other than digital advertisements, apps sometimes rely on influencers, self-service ads platforms and on sight activation.

2.3.1 Influencer marketing

Digital influencers are well known personalities and public figures who command a following and are capable of convincing their followers to install the advertised app. They advertise apps through their various channels across different social media platforms. For the marketing to be more effective, an app's selling point and that of the influencer should align since the consumer base is most likely to be the same as the influencer's audience. Each influencer has a value proposition and when it aligns to the app's central purpose, conversions are considerably higher. For instance a travel blogger may be well suited to advertise apps that help users to book flights, find accommodation, offer translation and leave reviews. More specific niches charge brands a higher amount than general niches. For instance advertisements with beauty influencers will

generally be more costly than those of comedy influencers. Influencers aim at creating brand awareness, reaching new audiences and generating sales.

There are two types of influencers, based on the size of the influencer's following. Macro-influencers tend to have a sizeable and global following. They typically have managers because they are considered "brands" in their own right and they have higher rate cards. Engagement is often used as a key indicator to measure fan loyalty. Micro influencers tend to have a considerably smaller following that could be a large friend base or a small, very engaged audience. The fan base is usually very loyal typically resulting in higher engagement and conversion rates. These influencers are generally fine with being compensated with product offers.

Influencers also choose brands to promote and advertise on marketplace platforms. Brands post requests to be promoted and influencers are allowed to choose from the range the ones they are interested in. The Plug app is an example of a marketplace platform where influencers can promote brands and get a performance based compensation, using a pay per install model.

2.3.2 Self service Ads Platforms

Self-service ads platforms allow brands to advertise on a social platform without the need of any advertising ads representative's help, normally through a control dashboard. Ads are placed on the advertising platform and the brand is able to customise the campaign for objectives, target users and ad placement. They typically advertise apps and lead the users directly to the Play Store or App Store, as applicable (6 Benefits of Self-Serve Advertising Platforms, 2020).

For instance, Facebook can show ads to people in specific geographical locations, defined by the advertiser. Just like Facebook, Instagram, can show advertisements based on previous searches and personal interests as well as the interests of the user's followers. Facebook allows users to create manual or automated ads from its dashboard, the Ads Manager. It allows real time tracking of conversion and measuring of actions taken within the app, if proper tracking is implemented (Business Help Centre, 2021).

Snap Ads advertises apps by directing new users to the App Store and existing users to the already installed app. Snap Ads can be used with a Mobile Measurement Partner (MMP) that allows app owners to optimize and track app installs and signups, while re-engaging current app users. All Snap Ads have extremely low friction to conversion since users only need to swipe up to move to the app store and download the advertised app (Why Advertise on Snapchat?, 2021).

TikTok has been one of the most downloaded apps of 2020 and shows ads depending on interests. Although TikTok's algorithm was shrouded in secrecy in the past, TikTok revealed that ads and content recommendations were based on preferences and the activity history of individuals. Consumer behaviour is also critical because users are more likely to have more content from brands and apps whose content they already consume. TikTok allows brands to find appropriate audiences, maximize on the ROI while tracking performance in real time (How TikTok Recommends Videos, 2021).

On the other hand, YouTube heavily relies on customer preference to advertise and market apps. Based on what a consumer typically consumes, YouTube aligns application ads that relate with interests and habits. Zeynep Tufekci calls YouTube the great radicalizer because it seemed to recommend progressively extreme content about an initial, harmless interest. She further terms Google (owner of YouTube) as "an advertising broker" that sells our attention to companies that

pay for it (Tufeski, 2018). Brands are charged depending on the clicks on ads or if the viewer consumes at least 30 seconds of a video ad.

2.3.3 On sight activation

On sight activation is any type of marketing promotion that is done on sight. Examples of these type of promotions are college or high school app launches. This promotion method is common in learning institutions and mostly uses student ambassadors in college and high school launches. This method may be considered intrusive and, therefore, runs for a short while. High population of like-minded individuals translate to high conversions. On sight activations acquire a small portion of the college or high school, and the following growth progress is largely attributable to the word of mouth.

2.4 TikTok

TikTok is a free social networking service for sharing videos native to China, initially as Musically and later to TikTok. It is most popular with Generation Z. TikTok works by allowing users to post short videos ranging between 15 seconds and 1 minute. Users are allowed to share videos on virtually every topic they are interested in and garner followers who enjoy their content. Engaging videos are re-shared by TikTok's algorithm on the "For You" page, where it could potentially have millions of views.

Although TikTok is an excellent tool for mobile marketing, there is no direct way to capitalize on a large following. TikTok allows users to attach links to accounts (Appendix C), which is how brands are able to drive traffic to their products.

Audience engagement (likes, comments, shares, watch time and rewatch rate) is the most crucial factor in TikTok's algorithm. The higher the engagement, the more the algorithm promotes a video. TikTok is heavily dependent on music and sounds in general. Trending sounds and music influence TikTok's algorithms to recommend videos with similar music (How TikTok Recommends Videos, 2021). Hashtag challenges are also prevalent on TikTok for advertisements because users are treated as co-creators by churning out content around a unified theme (Johnson, 2020).

2.5 Statistical Analysis

Given that this dissertation will include deep statistical analysis of the marketing campaign results, it is important to introduce the different statistical tests and concepts that will be used.

2.5.1 Pearson Correlation Coefficient

When we have two continuous variables, one can use Pearson's correlation coefficient as a test statistic to measure their association or relationship (Starovoytov et al. 2020). This test informs on the magnitude of their association, in addition to the direction their relationship takes. The two variables have to be on the same ratio scale or interval.

Zhang et al. found that at times two variables, in response to each other, could tend to go up. Such would indicate a strong positive correlation. At other times, one variable could go up the ratio scale while the other goes down, negative correlation between the two variables. The

Pearson correlation coefficient is between -1 and 1, with -1 indicating a strong negative correlation, 1 indicating a strong positive correlation and 0 indicating no correlation.

2.5.1 Difference of means test

The difference between means or mean difference is the absolute difference between the averages of two varying experimental or control groups. So, there are two or more existing means, and the means test difference is calculated by getting the difference between them (West, 2021). By absolute, we infer that the difference, even if negative, is taken as a positive - so that it makes sense.

2.5.2 Cohort Analysis

Cohort analysis is a subset of behaviour and personality analytics wherein users are grouped according to common characteristics to better monitor and understand their behaviours. Cohort analysis enables you to ask more focused, relevant questions and make better product choices that will significantly minimize churn and increase sales (Pope, 2012). Cohort analysis enables a business to "see trends clearly across a customer's (or user's) lifecycle, rather than arbitrarily slicing through all customers without allowing for the normal cycle that a consumer passes through". By observing these time trends, a business may adopt and customize its service to those particular cohorts. Although cohort analysis is often used interchangeably with cohort studies, the two are distinct and should not be confused (Pope, 2012). Cohort research is the evaluation of cohorts concerning big data and market analytics, in which data is divided into related categories. Market analytics' objective is to evaluate and present actionable data. Undifferentiated large datasets can contain a diverse range of user types and periods (Pope, 2012). Cohort research examines each cohort's users separately. In cohort assessment, "each new team [cohort] offers the ability, to begin with, a new collection of users," enabling the organization to examine and act on only the data applicable to the current question.

2.5.3 Quantitative and Qualitative Data

Quantitative data is described as the data value presented in figures or counts, with every set of data having its unique value in numerical form (Driscoll et al., 2017). Quantitative data are used to address questions like "How many?" "How frequently?" and "How much?" Mathematical techniques can be used to verify and conveniently analyze this data.

The term "qualitative data" refers to information that characterizes and approximates. Qualitative data is observable and recordable (Driscoll et al., 2017). This is a non-numerical data form. This form of data is gathered by evaluation, one-on-one interviews, and focus groups. In statistics, qualitative data is often referred to as categorical data – data classified according to the characteristics and properties of an item or a phenomenon. Quantitative data can be counted, calculated, and expressed numerically, while qualitative data is subjective and conceptual (Driscoll et al., 2017). Qualitative data may be classified according to their characteristics and attributes.

2.6 Final Considerations

To conclude this literature review, some conclusions will be extracted, that will be very valuable in the following chapters.

Firstly, it's important to highlight the nuances of generation Z and acknowledge its particularities. The fact that the teams behind the making of the apps are likely older than the target consumer, presents a challenge. Secondly, the increasing number of apps on the AppStore, makes it harder for an app to gain organic adoption, making it necessary to rely on growth marketing tactics for initial product growth and seeding. Thirdly, there is currently a wide range of marketing strategies for apps that offer immense opportunity for them to grow at a relatively low CPI. One of the most recent, and with higher ROI, marketing channels is TikTok influencer marketing. Finally, statistical analysis can offer marketers a strong insight on what factors influence campaign success and what consumers really want. The topics introduced in this literature review will be explored further along the dissertation.

3. Problem Description

The main objective of this study is to find a marketing strategy that leverages TikTok's artificial intelligence algorithm to reverse engineer virality. Before starting the analysis, it is important to understand the factors that influence mobile app's campaign success as well as TikTok's algorithm.

Since the goal is to find a successful strategy, it is also important to clearly define what that means. A campaign strategy is successful when it offers a replicable and scalable way of consistently getting downloads at a below industry standard CPI - cost per install.

3.1 Campaign Strategy

There are two factors that need to be taken into account when planning a marketing strategy: CPI and quality of downloads. Both are equally important and heavily depend on the campaign objectives and app characteristics.

Different apps will have different user acquisition requirements. There are three main categories of apps, from a social standpoint. The first one is the most social type of app, where the app depends on close graph network effects to be useful to the user, this is the case with most social media apps like Instagram or Facebook, where the biggest determinant of how well the user will retain, is the number of friends they have on the app. Promoting an app like this will typically require high density downloads, meaning that the acquired users will need to be in the same geographical location. The second one is apps that do not require network effects, but require other users to have the app. This is the case with a lot of online games where users do not necessarily need their close friends to have the app, but will still require a social component. It's important to highlight the difference between synchronous and asynchronous apps, since for the first kind, it is important that all downloads come from users in the same timezone, so that they are on the app at the same time. The third type of app is a solo app, where users can use the app alone without any network requirements, examples of these apps are fitness apps and productivity apps. Promoting solo apps has less constraints and opens room to a wider range of marketing techniques allowing for a much lower CPI. Generally speaking, the higher the density requirement for an app, the higher the CPI.

The value of a user is also important to be considered when trying to understand what CPI can be spent. Most apps are not built with immediate profit in mind, most opt to chase adoption first and worry about monetization when the platform is more mature. Having app monetization in place allows for a better sense of how much a user is worth and therefore allows for more adequate decisions when it comes to acquisition spending. Factors that affect user value must be taken into account, for example the location of the acquired users. Users in first world countries tend to have a higher value, since they will be more likely to purchase an app service, so can be acquired at a higher CPI.

3.2 Performance metrics

The most important performance metric for a marketing campaign is CPI, it is in most occasions the north star. The strategy that offers the lowest CPI will most of the times be the best strategy. It is commonly accepted that the industry standard CPI for social apps is around \$0.50 to \$1. That is the CPI that can be achieved with a self service ads platform like Facebook Ads or Snap Ads. The campaign CPI should always be compared to the expectable CPI for self service ads platforms since those are automated channels that are almost infinitely scalable. This comparison will allow us to understand if the extra effort put into the development of a new marketing strategy is worth it. If the cost per download that our strategy provides is equivalent to that standard value, and assuming download quality is equivalent, then our strategy serves no purpose since we can just use normal ads. The goal is to find a strategy that will outperform traditional ads and bring in more downloads at a much lower CPI

3.3 Advertising on TikTok

Advertising on TikTok, using influencer marketing, isn't as established as advertising in many other social media platforms. Therefore there are small challenges and differences that will need to be addressed.

One of the challenges is finding creators at scale. TikTok's FYP, contrary to other social media platforms such as Instagram, surfaces popular videos, not popular creators. Popular videos might be high quality videos that were posted by unestablished creators. Popular creators are creators that consistently post on the platform and have managed to build an audience. There are TikTok features that will help find popular creators. The first strategy to find creators is through brand hashtags. Most brands use campaign hashtags in their videos with the goal of increasing brand awareness and making the post more branded, some examples of brand hashtags used in TikTok campaigns are #itsmeapp and #fashionnovapartner. By selecting brands in the same niche, and finding their campaign hashtag, it is possible to find all the videos posted for that campaign and therefore all the creators that brand has partnered with. Another method is using the suggested accounts feature. By searching for suggested accounts of accounts that are in the same niche as the brand, we gain access to a list of similar accounts, likely also in the same niche. A more advanced approach is to use the FYP algorithm to get TikTok to highlight the best creators in a specific niche. By interacting with posts in a certain niche, TikTok will increasingly start showing more content from that niche, and therefore surfacing the most relevant creators. Lastly, working with influencer agencies is also a possible method, although more expensive.

TikTok creator's rates will vary greatly depending on their niche, number of followers, engagement, and management situation. By analysing a creator's profile it is possible to establish an estimated view count for a sponsored post, and with the deal price, arrive at an estimated cost per 100k views - CPMM. The majority of creators will have an estimated CPMM of \$50 to \$500. Other less common deal structures are: PPV or mixed PPV with a base rate. In alternative to establishing direct contact with management agencies and creators, creator marketplaces with pay per install models can be used.

It is important to highlight that given the way that the Tiktok algorithm works, views are much more variable than in other platforms. On Instagram or YouTube, the engagement rate is about constant and a creator can predict with high accuracy if their followers are gonna like a piece of content, on TikTok that becomes much harder. A small creator can have just as much engagement as a large creator, if they post the right content. That also means that a large, and

very expensive, creator can have an engagement rate much lower than their average, if they post the wrong content or the right content in the wrong format. It is therefore important to understand the general rules about creating TikTok content that will be able to maximize the platform's potential.

As mentioned previously, TikTok is an entertainment app where content creative is the focus of the platform. Unlike other apps, TikTok's user experience is extremely immersive and consists of short bursts of entertainment or education. The fact that TikTok has a very unique user experience and value proposition, makes its content format stand out. Being aware of the particularities of that content format will help brands produce better content and make their campaigns seem more organic to the platform. TikTok demands a very different set of "best practices" when it comes to content creation. Firstly, all videos should be shot with an iPhone camera in 9:16 vertical video, since that's what the platform optimizes for. In addition to that, since music is a big part of how TikTok categorizes the video, it's important to use trending sounds. Finally, using content trends that other creators are using will give content higher value inside the platform. Content trends usually last from a few days to two weeks, while sounds can last up to a month.

Variables that can influence the virality on TikTok

TikTok's FYP is complex and listing all the factors that might influence performance of videos is challenging. It is known that TikTok's artificial intelligence algorithm analyzes the video for information, both image and audio. On top of that, the video metadata like hashtags, caption, tagged accounts and sound also give the TikTok algorithm information about the video. In addition to that, the engagement action's performance, especially watch time and rewatch rate, are known to positively affect the outcome of a video, along with the traditional engagement mechanisms (like, comments and shares). Finally, the creator's account also plays a big role in the performance of the video. The diagram below (figure 4) represents all the variables known to influence the virality of a video on TikTok. The variables represented in blue are the variables that will be analysed in the following chapter.

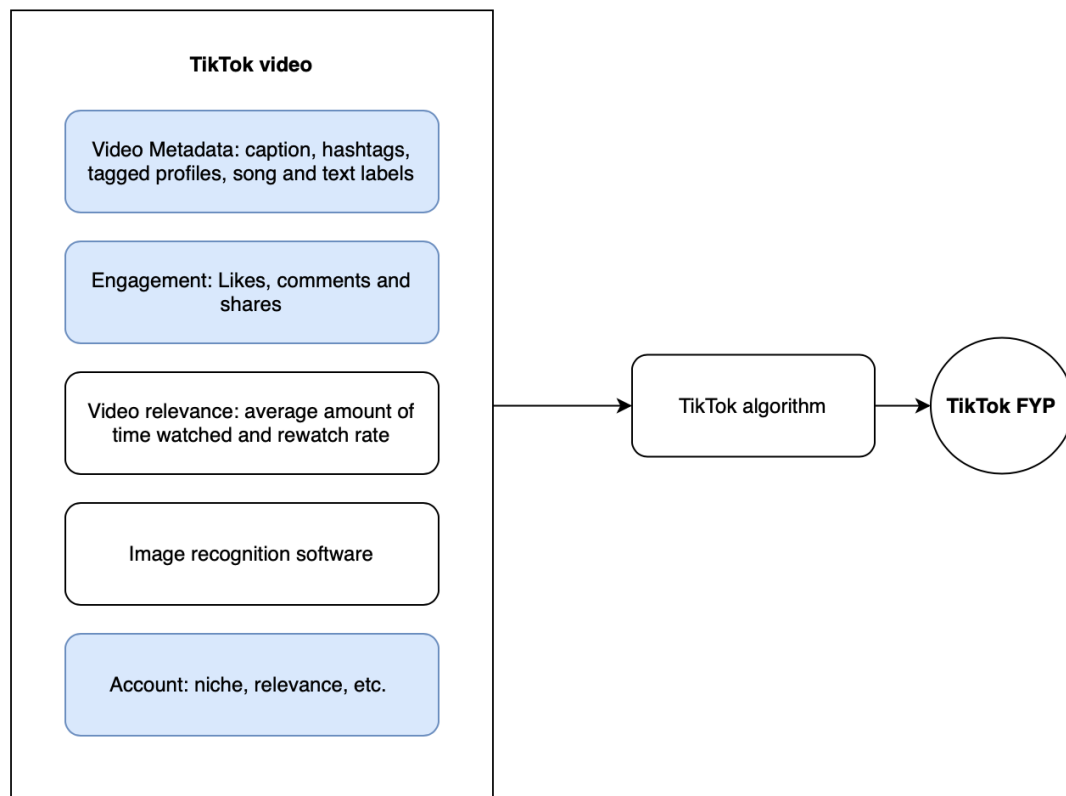


FIGURE 4 - VARIABLES THAT CAN INFLUENCE THE VIRALITY ON TIKTOK

Importance of getting on the FYP

As mentioned previously the FYP is TikTok’s explore page, where users spend most of their time and where most of the value the platform has to offer is seated. The FYP is tailored for each user in particular, using a complex artificial intelligent algorithm that is capable to consistently show users new videos that will keep them interested and on the platform for longer.

In simple terms, when a creator posts a video, that video is initially shown to their followers and based on their initial reaction, TikTok’s algorithm will decide if the video is good enough to be shown on the FYP to other users that share the same interests, but don't necessarily follow the creator. Here is where the opportunity lies, if the creator is able to create a good enough video to be shown on the FYP, the video will be distributed to new audiences of users who share the same interests, therefore, users that are extremely likely to engage with the video.

Applying this concept to an influencer marketing product promotion on the social platform: a promotional video is posted and initially shown to the followers of the partner creator. These followers may or may not like the product that’s being advertised, based on factors discussed ahead. But if the video is distributed on the FYP, TikTok will show that video to the users who will most like the video, and therefore the product being advertised. In conclusion, the conversion rate (number of downloads per view) for views that come from influencer’s followers is much lower than the views from the FYP, since the last ones are targeted

Understanding the creator’s brand

Understanding each creator's brand on TikTok is key to understand which influencers to choose should market each product. Each creator has a general niche and a particular niche. The general niche is what their videos are about, or the general theme of their page. Examples of general niches are: fitness, cooking, dating. The general niche of each creator is generally easy to find since their whole page revolves around that topic. In addition to the general niche, there's a particular niche, that is much more subtle but equally as important. The particular niche is how the creator approaches their main niche. The particular niche can be a content style or a way of presenting information that's unique to the creator. Examples of particular niches are: comedy, skits or POV.

It is also important to understand which general niche and particular niche can promote each app better. And for that it is crucial to define very clearly the app's niche and target user. One of the biggest challenges in promoting an app on TikTok is understanding which niche of creators should be promoting the product. Finding the right niche to promote the app means the app will have higher chances of reaching the FYP and will make the campaigns performance indicators soar.

3.4 Problem Formulation

As mentioned before, the main objective of this dissertation is to find a strategy to promote social apps on TikTok that leverages the artificial intelligence algorithm to achieve virality, describe its implementation and proceed to evaluating its efficacy.

Moving forward, this dissertation will focus on the campaigns developed for two mobile apps, Zoom University and Poparazzi. The Zoom University campaign will be analysed and the conclusion from that campaign will be leveraged on the Poparazzi app campaign. Figure 5 illustrates the process.

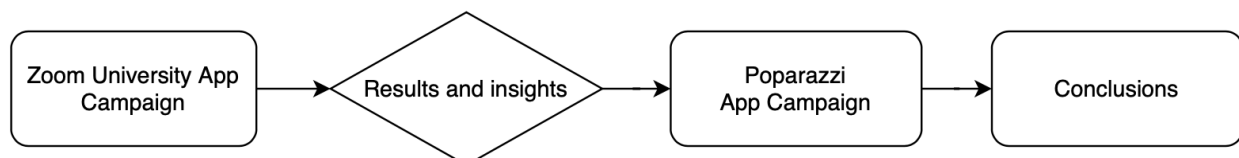


FIGURE 5 - ANALYSIS STRUCTURE

Since both apps were promoted using similar strategies, the results obtained from the deep analysis of the first campaign will be of extreme value for the second campaign, providing unique insights that will be leveraged to achieve bigger campaign success.

4. App Campaign Strategy

This chapter will go over the campaign developed to promote the application Zoom University, its methodology, results, and next steps for optimization. After that, the implementation of its results in the Poparazzi app's campaign will be analysed.

4.1 Zoom University Campaign

4.1.1 Overview

The marketing campaign to promote the social app Zoom University was full of trials and errors. The first step in the campaign was to define what the target user to be acquired was. It was decided that the target user were college students of aged 18 to 23 years old that lived in the United States.

With many possible marketing channels in mind, the first promotion attempts were with YouTube influencer ads, Facebook Ads and promotional posts on Instagram meme pages. All the promotion methods tried had some positive results, but all of them were found to be too expensive with CPIs of over \$1. With influencer marketing tested on YouTube and Instagram, it was an obvious next step to try the same concept on TikTok. The first video posted about the app went viral with over 2.2 million views and 123 thousand shares.

It was defined that TikTok influencer marketing was the strategy to pursue. With the platform just gaining traction due to the first COVID-19 lockdowns, a lot of new influencers were coming on the app and accumulating large follower basis in a short period of time. Most of the times these creators were willing to work for values lower than market rate on other platforms, \$20 to \$50 estimated CPMM was the campaign's initial price target.

With little brand presence on TikTok there were few campaigns that could be analysed. The first videos posted on the Zoom University campaign were with micro influencers, typically with less than 50 thousand followers. These were high quality videos heavily curated by members of the team. This first approach at TikTok influencer marketing resulted in a CPI of \$0.27. Since the results with this wave of videos were positive, it was decided that moving to bigger creators, using the content format developed with micro influencers, was the direction to follow. The second wave of videos posted in the campaign was with medium to large sized creators, with follower counts ranging from 200 thousand to more than 10 million. The strategy adopted for creator selection in this wave was purely based on estimated CPMM, creators with low CPMMs would be chosen first. This second approach resulted in a lower CPI of \$0.23. The third and final wave of the campaign was developed using the analysis in this study.

By the end of all three waves of the TikTok campaign promotion, Zoom University had accumulated over 125 thousand downloads on the AppStore and reached top nine on the Social Networking category of the United States AppStore, all in under seven weeks.

It is important to highlight that the campaign didn't include the app link in the bio section of the creator's profile. It was decided that the app link would not be included, since including the app link would give the video a promotional feel that was seen as something that could decrease conversion rate. The goal was for the videos of the campaign to look like user generated organic content.

Given the nature of the product, a dating app, a few challenges were encountered when doing promotions on TikTok. The first challenge was density. Since TikTok's FYP does not primarily target location, it was hard to acquire users in close proximity to each other, geographic user density was low. The second challenge was to achieve gender and age balance. It was important to match users that had around the same age, and in addition to that make sure that the amount of users of both genders on the app at a given time was equivalent.

To measure download quality, three quality indicators were tracked for each video's downloads. The first indicator was age distribution since that due to the nature of the app it was important to acquire users over the age of 18, the percentage of users over the age of 18 was measured for each creator. The second indicator was gender distribution. Having a gender distribution close to 50% was ideal since the app required an equal amount of users from both genders to join at the same time to function properly. Having an imbalance in user's genders would result in some users not being matched on video calls and user complaints. The final indicator was percentage of user's that joined calls. This indicator was very important since it would provide insights on how relevant the product was to the acquired audience.

4.2 Methodology

This subchapter will provide an insight on the methodology used to execute the Zoom University campaign, going over the variables used and the selection and collection process, the performance indicators selected and the posterior qualitative analysis of the results and monitoring framework.

Variables

For the purpose of the study and given the small sample size, all measurable variables that can influence the success of the promotional videos, will be analyzed.

The first step in the analysis, was to establish a view target for each video. Two view count targets were established: fixed view count and moving view count - respectively ***fv*** and ***mv***. The fixed view count target, was defined as each creator's estimated amount of views, based on past videos of the same kind, typically previous brand partnerships or ads. Those types of videos usually get around 20-30% less views than normal content, since they're less interesting to viewers, and less likely to be shown on the FYP. Since views on TikTok vary greatly in short time periods, a moving view target was also established. The moving view target was established as the average view count of the two previous posts and the two following posts. The average view count of those four posts would determine the sponsored video's moving view target. That way each video would have its own moving view target, and the fixed view target was unique to the creator and would mostly stay the same. If ***bef*** is the summed view count of the two videos posted before the promotional post, and ***aft*** the summed view count of the two videos posted after the promotional post. The moving view target is given as follows:

$$MovingViewTarget(mv) = \frac{bef + aft}{4} \quad (4.1)$$

Using the fixed view count target and video price - p - it was possible to calculate an estimated cost per 100k views - estimated CPM. This value represents how expensive a creator is, and would provide an easy way of comparing two creators. Comparing estimated CPMs must take into account that the conversion rate between creators can be hugely different.

The total realized view count would be measured after 3 days the video was posted, and would be manually scraped from the TikTok app. The realized video views were compared to the moving view target calculated previously to give us the video relevancy coefficient. The video relevancy coefficient measures how interesting or relevant the video was for the specific audience that watched it, and is obtained by dividing the video's realized view count by its moving view count target - see (4.2).

$$VideoRelevancyCoefficient(q) = \frac{RealizedViewCount(v)}{MovingViewCountTarget(mv)} \quad (4.2)$$

Analysis on the realized engagement of each video would also be done 3 days after the video was posted, and scraped manually using the TikTok app. An engagement coefficient was calculated for each engagement metric: likes, comments and shares. The realized counts for each engagement metric are respectively - **lik**, **com** and **shr**. The engagement coefficient for each metric was obtained by dividing the realized metric by the realized view count of each video, giving us an engagement rate.

$$LikeCoefficient(likq) = \frac{lik}{RealizedViewCount(v)} \quad (4.3)$$

$$CommentCoefficient(comq) = \frac{com}{RealizedViewCount(v)} \quad (4.4)$$

$$ShareCoefficient(shrq) = \frac{shr}{RealizedViewCount(v)} \quad (4.5)$$

Since one of the priorities for the campaign was to make the promotional videos as organic as possible, it was important to understand the impact of including an AppStore screenshot (Appendix A) in the video, as well as the campaign hashtags (Appendix B). The variable tracked for each video posted.

Other variables like the day of the week, and time of posting were also considered important values in the optimization of the campaign and therefore also tracked for each video.

Finally, it was needed to understand how relevant each creator was in the promotion of the Zoom University app. The goal was to define how well the influencer's niche and video creation style aligned with the app's value proposition and brand message, defined as the brand/influencer fit score. For this, a three degree quality indicator was developed - **bifs**. The brand/influencer fit score was obtained by analysing each creator's video style, video content and personal message,

and attributing a score to them (1 to 3) based on how well their message aligned with the app. Starting by analyzing each creator's general and particular niches, and also defining what were the app's target niches were, each creator was assigned a **bifs**. If the creator's general niche did not align with the general niche chosen for the app, the creator would be scored 1. If the general niche of the creator was aligned with the brand, but the particular niche did not, the attributed score would be 2. And finally, if both general and particular niches of the creator aligned with the app, the creator would be attributed a 3.

Performance Indicators

As mentioned previously, the biggest campaign performance indicator is CPI. To arrive at a cost per install figure that is individual to each creator, it was needed to attribute downloads. Download attribution is the process of assigning a download to the creator that drove the behaviour.

The biggest challenge in implementing a download attribution model is to find a way of knowing where the download came from, without causing too much friction to the user. The implemented decision was an extra step during the app onboarding where the user would be prompted to share which TikTok creator referred them. The screen read "Which TikTok referred you?" with a text field below it. By including that onboarding step, it was possible to track how many referrals came from each creator. By creating cohorts of users using various ways they could reference each creator, we were able to find out exactly how many downloads each influencer drove.

The number of referrals for each creator was significantly different from the total number of downloads - **d** - each creator brought, since the majority of users would skip the referral step in onboarding. The next step in calculating the total number of downloads each creator brought, was to understand what was the percentage of users that came from an ad, but did not refer the creator. By using data from a promotional video that was posted before the campaign started and accumulated over 2.2 million views, we were able to arrive to the figure of 13%. Using an isolated video allowed for an accurate calculation, since it was possible to understand how many downloads came from that video in specific. This rate was later confirmed by other viral videos where the impact in downloads was very clearly identified.

This analysis was taken a step further by narrowing down referrals for each specific video. Since the campaign required creators to post one to two times a week, a time interval of two days after the video was posted was defined to attribute downloads to that video. This allowed us to fully understand how many downloads came from each video and that way have a much more concrete understanding of how the variables mentioned above altered the performance indicators.

Finally, having the number of downloads, number of views and cost of each video, it was possible to calculate the conversion rate (4.6) and CPI (4.7) of each creator as well as each video in particular.

$$Conversion(k) = \frac{Downloads(d)}{RealizedViewCount(v)} \quad (4.6)$$

$$CPI = \frac{Downloads(d)}{Price(p)} \quad (4.7)$$

Statistical Analysis

Through adequate testing we can find out the answers to established hypothesis, and understand the value associated with a change, which allows for more accurate rollout decisions.

A strength of relationship test, using Pearson Correlation Coefficient, was established as the best way to estimate the relationship between the performance indicators and other variables: video relevancy coefficient, like coefficient, comment coefficient, share coefficient.

To analyse the impact of the *bifs* score of each creator, a difference of means test was performed. This test aimed to evaluate the impact of different *bifs* scores, and also understand if the extra cost of influencers with *bifs* equal to 3 was worth it. This test was performed with two samples: sample A, every creator with *bifs* score equal to 2, and sample B every creator with *bifs* score equal to 3.

It was decided that performing another difference of means test would be the best strategy to evaluate the impact of using the AppStore screenshot in promotional videos. Including the AppStore screenshot several advantages. The most significant one is that the viewers have a clear understanding that the video is about an app that is on the AppStore, they're informed about what the app name is, and how to get it. Including the AppStore screenshot also means that the video will look much more like a promotional ad, possibly resulting in fewer views. The difference of means test was done with two samples: sample A, with videos that did not include the App Store screenshot, and sample B with videos that included the App Store screenshot.

Another difference of means was planned to analyze the impact of utilizing the campaign hashtags (#zoomuniversity and #zoomuapp). Similarly to including the AppStore screenshot, including the campaign hashtags gave the video a promotional feel. The difference of means test was done with two samples: sample A, with videos that did not include the campaign hashtags, and sample B with videos that included the campaign hashtags.

All tests performed included the data from 102 videos of the campaign and 39 creators.

Measuring Variations in Performance Indicators

Pearson Correlation Coefficient

To measure the the strength of the relationship - r - between the variables and their association with each other, the Pearson correlation coefficient will be used. The Pearson correlation coefficient will return a value between -1 and 1, with -1 being the strongest possible negative correlation and 1 being the strongest possible positive correlation (Joseph, 2021). It is calculated using the following formula (Fleetwood, 2020):

$$r = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{[N \sum x^2 - (\sum x)^2][N \sum y^2 - (\sum y)^2]}} , (4.8)$$

where:

- N - the number of pairs of scores
- $\sum xy$ - the sum of the products of paired scores
- $\sum x$ - the sum of x scores
- $\sum y$ - the sum of y scores

- Σx^2 - the sum of squared x scores
- Σy^2 - the sum of squared y scores

The next step in this analysis will be to understand how significant is the r value obtained through the Pearson Correlation Coefficient calculation. To do that, the p -value needs to be calculated. The p -value determines the significance of the relationship between two variables. It does so by evaluating how well the data rejects the null hypothesis, which states that there is no relationship between the two variables. Rejecting the null hypothesis successfully means there's a strong probability that the correlation is significant (Joseph, 2021).

The p -value is calculated using a t-distribution with $n-2$ degrees of freedom.

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \quad (4.9)$$

The p -value is the combined area of both tails, since a two-sided test will be performed (Al., 2021). The significance level chose for this analysis was $\alpha = 0.05$, representing a 95% confidence level.

The decision rule is the threshold at which we consider a correlation significant or not significant.

- If $p \leq \alpha$: there is a significant relationship between the variables
- If $p > \alpha$: there is no significant relationship between the variables

Difference of means

The second test performed in this analysis was a difference of means test. This test's results were measured by the uplift, assuming X represents the metric being evaluated:

$$Uplift_{(A,B)} = \frac{X_B - X_A}{X_A} \quad (4.10)$$

The difference in both means will be measured by the following formula:

$$Diff_{A,B} = X_A - X_B \quad (4.11)$$

Another significance test will need to be done for this second test. The significance value used for this test will again be $\alpha = 0.05$, meaning 95% confidence level. A two tailed test will be performed.

$$H_0: X_A = X_B$$

$$H_1: X_A \neq X_B$$

The test method to determine whether the difference between means is significant in the context of the problem will be a two sample t-test. The first step will be to calculate the standard error - **SE** - which is given by the following formula (Hypothesis Test: Difference in Means, 2021):

$$SE = \sqrt{\left(\frac{S_A^2}{n_A}\right) + \left(\frac{S_B^2}{n_B}\right)} \quad , (4.12)$$

where:

- S_A - Standard deviation of sample A
- N_A - size of sample A
- S_B - Standard deviation of sample B
- N_B - size of sample B

The second step is to calculate the degrees of freedom - **DF** -, given by the following formula (Hypothesis Test: Difference in Means, 2021):

$$DF = \frac{\left(\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}\right)^2}{\frac{\left(\frac{S_A^2}{n_A}\right)^2}{n_A - 1} + \frac{\left(\frac{S_B^2}{n_B}\right)^2}{n_B - 1}} \quad (4.13)$$

Third step, the test statistic is given by the equation (Hypothesis Test: Difference in Means, 2021):

$$t = \frac{(\bar{x}_A - \bar{x}_B) - d}{SE} \quad (4.14)$$

Where:

- $\bar{x}_1$ - mean of sample 1
- $\bar{x}_2$ - mean of sample 2
- d - hypothesized difference between population means

Finally, with the p-value is computed using the test statistic and the degrees of freedom. Similarly to the first test in this analysis, a significance level of $\alpha = 0.05$ will be used. The decision rule will also be equivalent to the first test, where the p value is compared to the significance level, and the null hypothesis is rejected when the P-value is less than the significance level.

Monitoring Download Quality

Monitoring download quality was a very important priority from the beginning. It was clear that most downloads came from viewers that specifically resonated with the value proposition of the app and that were in one way or another in the target audience for the app. By nature, TikTok's algorithm would show the video to viewers who are interested in the app concept.

To measure download quality, three key indicators were tracked for each video: gender, age distribution (above or below 18 years of age), and calls joined. The video quality would be considered good if they fit the following criteria:

- Gender: each gender below 70%
- Age distribution: above 80% above 18 years old
- Calls Joined: above 50% joined call in the first day

4.1.3 Results

The first analysis, using the strength of relationship test, using Pearson Correlation Coefficient, offered some very valuable insights in how the video metrics affected performance indicators. The video metrics analysed are: video relevancy coefficient (*q*), like coefficient (*likq*), comment coefficient (*comq*) and share coefficient (*shrq*). As mentioned before, this analysis was performed with a confidence level of 95%. The analysis' results are shown in table 1.

Table 1 - Effect of video metrics on KPIs

Conversion (k)				
	r	DF	t-score	p-value
q	.64	100	8.3292	<.001
likq	.02	100	0.2000	.840
comq	.37	100	3.9826	<.001
shrq	.62	100	7.9020	<.001

CPI				
	r	DF	t-score	p-value
q	-.25	100	-2.5819	.012
likq	.22	100	2.2552	.027
comq	.02	100	0.2000	.045
shrq	.25	100	2.5819	.012

The second analysis, using the difference of means test, analysed the impact of the creator's *bifs* score in the campaign's KPIs. As mentioned before, this analysis was performed with a confidence level of 95%, where the "alternate" mean represents the mean for creators with *bifs* score equal to 3 . The analysis' results are shown in table 2.

Table 2 - Effect of creator's *bifs* on KPIs

Conversion (k)						
	Uplift	Diff	SE	DF	t-score	p-value
Alternate	1.2029	-99.00	44.8534	22	-2.2069	0.0190

CPI						
	Uplift	Diff	SE	DF	t-score	p-value
Alternate	-0.3208	0.83	0.7317	11	1.1300	0.8587

The third analysis, using the difference of means test, analysed the impact of adding the AppStore screenshot (Appendix A) to the promotional videos. As mentioned before, this analysis was

performed with a confidence level of 95%, where the “alternate” mean represents the mean for videos that include the AppStore screenshot. The analysis’ results are shown in table 3.

Table 3 - Effect of AppStore screenshot on KPIs

Conversion (k)						
	Uplift	Diff	SE	DF	t-score	p-value
Alternate	-0.6664	-93.3	23.5320	45	-3.9651	<.001

CPI						
	Uplift	Diff	SE	DF	t-score	p-value
Alternate	-0.2593	1.86	3.6808	16	-0.5000	0.3119

The fourth test, using the difference of means test, analysed the impact of adding the campaign hashtags to the promotional videos. As mentioned before, this analysis was performed with a confidence level of 95%, where the “alternate” mean represents the mean for videos that include the campaign hashtags. The analysis’ results are shown in table 4.

Table 4 - Effect of campaign hashtags on KPIs

CPI						
	Uplift	Diff	SE	DF	t-score	p-value
Alternate	-0.1400	20	28.3552	27	-0.6961	0.2462

CPI						
	Uplift	Diff	SE	DF	t-score	p-value
Alternate	-0.0751	0.45	3.5107	15	0.1300	0.5509

Analysis of the results

The results of these analysis were very informative and revealed that there was a lot of room for optimization in the campaign. The aforementioned third wave of the Zoom University app campaign was planned, taking into account the results of this analysis.

The first conclusion from the results, derived from the difference of means test performed on the AppStore screenshot usage. It was concluded that having the promotional videos not include the AppStore screenshot would increase conversions. Therefore, a higher level conclusion that can be extracted from this test is that videos that seem more organic and less like a promotion will perform significantly better.

The second conclusion derived from the strength of relationship test, using Pearson Correlation Coefficient. It was concluded that choosing creator with higher niche relevance, with bifs score

equal to 3, would result in promotional videos that achieved higher conversions at a lower CPI. It was concluded that the bifs was the most influential variable of video success, therefore its best predictor. It was also observed that influencers with higher bifs score would outperform their normal content, with the promotional videos. Therefore there was a win-win relationship where the creator also wins since the brand helps the creator go viral.

An interesting observation is that even though advertising with creators that have smaller and more concrete niches might be multiple times more expensive, the end result is worth the extra cost, since their conversions are higher, they are able to offset the elevated cost and end up with a lower CPI than other creators.

The third wave of the Zoom University app campaign took into account the results from this analysis. This final wave of promotional videos on TikTok focused only on creators with bifs score equal to 3, and the results outperformed the past two waves, achieving a CPI of \$0.17. The fact that the third wave performed significantly better than the previous two waves validates the analysis done and brings up a series of possible further experiments.

Next Steps

With the results from this analysis it was possible to reduce the CPI of the Zoom University app campaign from an initial \$0.27 to \$0.17. The next step in this analysis will be to understand how the results from the Zoom University app campaign can be leveraged on other app's campaigns. This will be done with the Poparazzi campaign strategy, detailed in the following section

4.2 Poparazzi Campaign Strategy

Taking into account the conclusions from the Zoom University app campaign, and given its extreme success, the starting point for the Poparazzi app campaign was TikTok. It was previously concluded that choosing the most relevant creators for each brand's niche has extreme benefits in TikTok campaign performance. Influencers with higher bifs score would go viral a lot more easily than others, and would manage to create a win-win scenario where their promotional videos would perform better than their normal content.

An initial test was ran, where micro influencers with high bifs score would be selected to create videos promoting the app. Since their expected view count was between 1,000 and 5,000 views, much lower than macro influencers, the expected CPMM of the videos ended up being even higher than the high bifs score macro influencers. This happens because with a higher expected view count the range for negotiation is bigger and therefore the locked deals tend to have a lower expected CPMM. Since the upside potential was so high if a video went viral, the campaign was sustainable. If only a fraction of the videos went viral, even though the majority of videos didn't pay off, the global result of the campaign would be good. It was found that around 1 in every 22 videos posted would get more than 100k views, balancing out the final campaign CPMM and resulting in an attractive CPI. The results were motivating, this strategy managed to slightly outperform the results obtained in the Zoom University campaign, achieving a CPI of \$0.15.

In parallel to that, another test was performed. The hypothesis of that test was that even though the influencers chosen to create the promotional videos had high bifs score, it was sometimes hard to define the general and particular niches indicated to promote certain products. Poparazzi was an example of that situation. Unlike Zoom University that had a very concrete area, dating, and therefore its niches were easily defined, Poparazzi didn't have a very obvious particular niche.

A challenge was faced, there was no clear brand/influencer fit with any creator, since the particular niche wasn't clearly defined for Poparazzi it was hard to rate the creators on their bifs score.

The logical question that followed this challenge was, 'is it possible to find or create an account that will have perfect brand/influencer fit, for a product that doesn't have clear general or particular niches?'. The first step in this test was getting one of the micro influencers that helped perform the previous test, to create a new TikTok brand account where only promotional videos would be posted. These videos would have to be organic content about the app, just like user generated content would look like. With much surprise, the second video posted on that new account went viral with over 1.1M views. The second step in the test, motivated by the positive confirmation from the first step, was to continue posting on the recent account. All the videos that followed the viral video did progressively worse. The account lost exposure quickly. The third step in the test was to try and replicate the success of the new account that was created in the first step. A total of five micro influencers were selected to create brand new TikTok brand accounts to promote Poparazzi. Two of the five newly created accounts got a viral video within the first four videos. The test had a very positive result and therefore it was decided that pursuing this strategy was the most efficient way to promote Poparazzi.

Similarly to the Zoom University app campaign, it was decided that this campaign would not include the download link in the account's bio section, for the same reason of wanting to keep the videos organic. The strategy was pursued and a total of 965 promotional videos were posted with 211 different creators. The videos accumulated a total of 32M views.

Since the marketing campaign for Poparazzi started while the development of the app was still in progress, the team decided to set a release date on the AppStore for the app, and start accumulating pre-orders. Pre-orders let users get notified when the app is released, as well as get it automatically downloaded to their phone. Since the campaign was done with micro influencers and new accounts, the majority of the videos would get almost no views and result in very little downloads, it was then very easy to match the spikes in app pre-orders with the viral video that caused them. The conversion rate of each video was calculated by dividing the number of pre-orders by the number of views (in hundreds of thousands), giving us the total

4.4.1 Results

It was found that not only videos that were posted on new TikTok brand accounts had a higher likelihood of going viral, but they also were able to achieve conversions significantly higher than the videos posted on influencer's pages. Since Poparazzi was accumulating pre-orders and not downloads, and the method of calculation of conversion is very different between both campaigns, it wouldn't be statistically relevant to do a deep comparison between both conversion rates. But it is safe to assume that the conversion rate of a viral video that reached the fyp is around 5-10 times higher than that of a video posted on an influencer's page that did not reach the fyp. Poparazzi's promotional video's conversions were

The fact that Poparazzi was posting a large amount of promotional videos that looked like user generated content, motivated other fans of the app to create their own versions of the videos. The marketing campaign ended up triggering a wave of organic user generated content that resulted in even more virality around the app.

Unrelated to the purpose of this analysis but still a key factor in success of the strategy was the introduction of a pre-order model on the AppStore. This detail built a lot of anticipation around the app, since people were interested in the concept but couldn't still use it. The fact that fans couldn't use the app yet, got them to talk about it even more and generate a group fear of missing out phenomenon. This was great for brand awareness and helped solve the density issues presented by TikTok campaigns, since fans would organically share the app with their friends by word of mouth.

Before launch Poparazzi had accumulated over 530 thousand pre-orders on the AppStore which resulted in a fast climb to the number one spot on the US AppStore, as well as many other countries.

6. Conclusions and Next Steps

6.1 Critical Reflection

From a top level view both app promotion campaigns were extremely successful and definitely outpaced any traditional marketing method that is available. The fact that the campaigns offered such good results, illustrates the current opportunity marketing teams have in their hands. The price difference between growth hacking tactics and the more established self service ads platforms, shows how unestablished and fast paced the social media marketing space is.

The insights obtained in this dissertation not only serve to better understand how the TikTok algorithm works, but also how it can be leveraged to better promote brands. The results firstly illustrate how the niche of selected campaign influencers heavily affects the outcome of promotions. And secondly, how brand accounts can be leveraged to achieve virality in products where there's no strong influencer niche match.

Another high level conclusion taken from this study is that TikTok's app growth has provided an amazing opportunity for creators and brands to establish themselves. The potential of the app is very big, and even with the space becoming increasingly crowded, the opportunity is still there. The fact that the platform surfaces content instead of creators in the very targeted FYP, makes it possible for a newcomer to outperform established creators and brands.

6.2 Next Steps

With the conclusions taken from both app's campaigns it is possible to find optimization areas that lead the campaign strategy to achieve even better performance. In addition to that, it is also possible to leverage the findings in this dissertation to develop new highly preferment campaign strategies. Three challenges to be addressed in the future:

- One of the challenges with both campaigns is that the scalability was in some ways limited. It was hard to get past a certain number of downloads per day, since both strategies heavily relied on the videos going viral. One possible way to combat this difficulty is to leverage the videos created by the influencers and run them as creative assets on self service ads platforms like TikTok Ads or Facebook Ads.
- Another challenge with both campaigns was the fact that the views on TikTok videos are very geographically scattered, resulting in an also very scattered user base. Given that both apps require the users to have their friends on the app, this was a problem that needs to be addressed. A possible next step to solve this problem, is two try and target user bases on TikTok. It is frequent for videos to go viral inside certain communities (colleges, cities), if videos like that can be replicated at scale, that solves density issues.

- Finally, the fact that influencers are getting increasingly more expensive as TikTok matures as a platform and gains global adoption, presents a threat to these types of growth strategies. New tactics like the one developed to promote Poparazzi will have to be developed to take advantage of other opportunities offered by TikTok, other than influencers.

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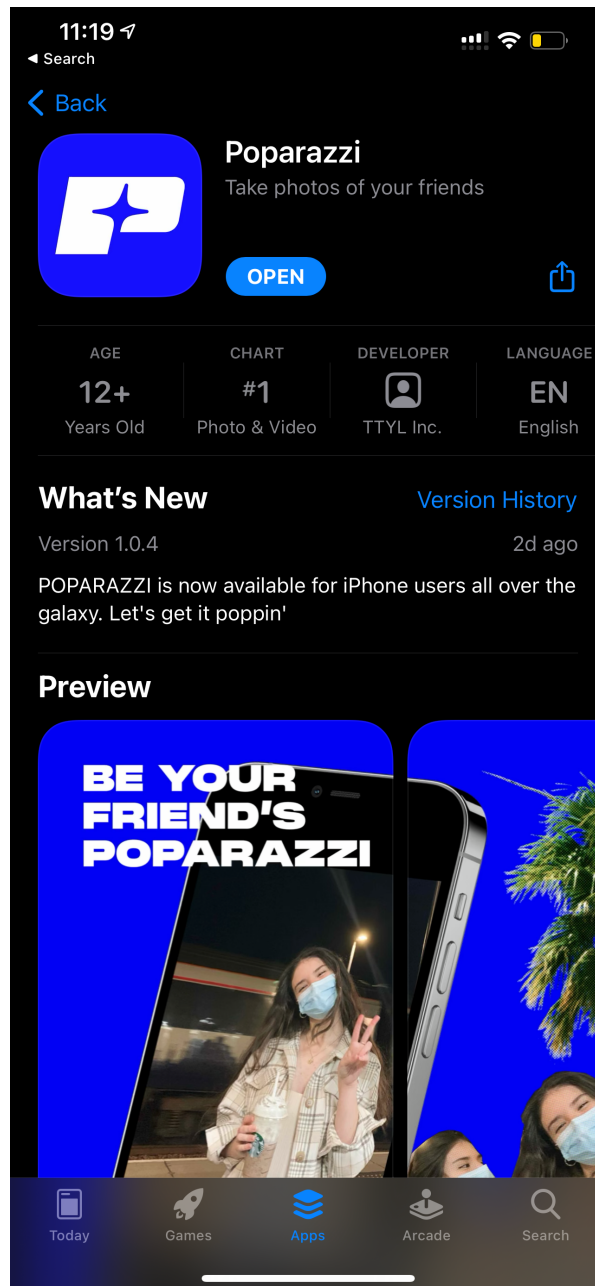
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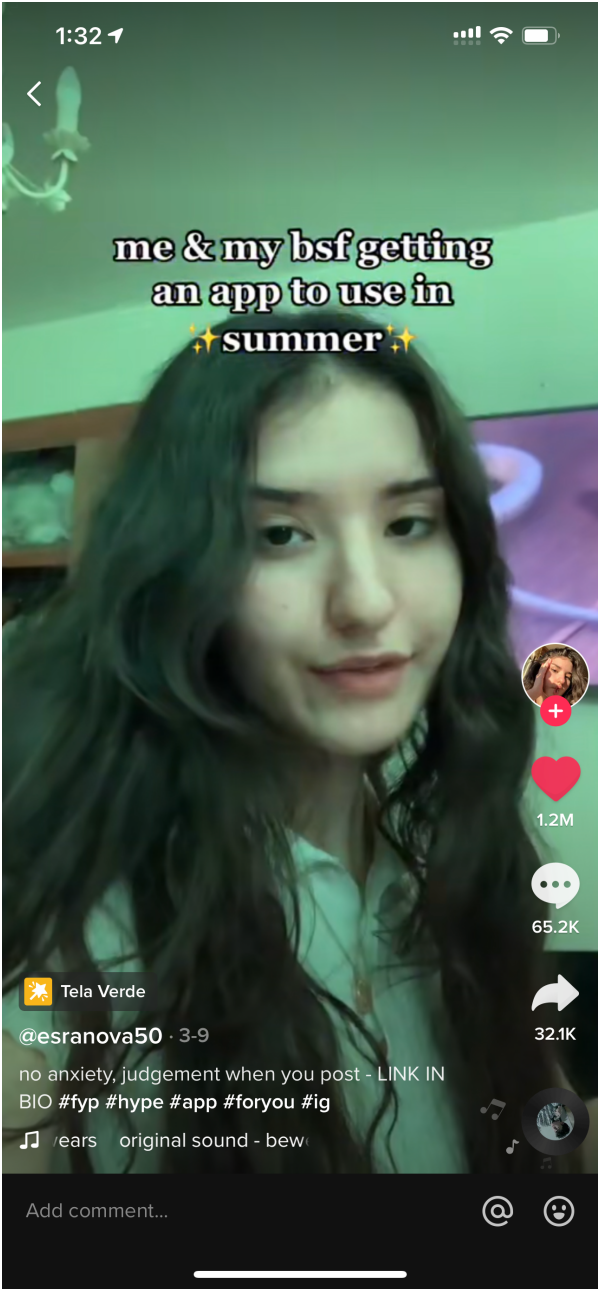
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Appendix A - AppStore screenshot



Appendix B - TikTok Video



Appendix C - TikTok Profile

