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# Data-driven Method for Mobile Game Publishing Marketing Promotion

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**Abstract**—Marketing is vital for game businesses. However, it is hard to reach the target audiences and choose the right marketing strategies for different user acquisition channels in mobile game publishing. This paper shows how business intelligence can guide independent (indie) mobile game developers to do marketing promotion based on a data-driven method. We apply and extend the ARM funnel model from social game publishing to mobile game publishing and provide a data-driven method to evaluate the marketing promotion performance. First, in order to address indie game marketing challenges, we propose a data-driven method by defining key metrics and applying two different analysis methods for assessing mobile game marketing promotion. Second, we apply our data-driven method to an indie mobile game project and guide the indie game studio to determine the potential marketing promotion issues. Third, we also provide suggestions on improving marketing performance based on analysis results, especially by differentiating between channels. Finally, we summarize how our method can be generalized and used to guide indie mobile game marketing promotion, find high-quality channels for user acquisition, improve the marketing promotion effect, and discuss future research work.

**Keywords**—business intelligence, indie game developer, game analytics, marketing promotion, metrics, ARM funnel model, channel.

## I. INTRODUCTION

Business Intelligence (BI) combines operational data with analytical methods to present complex and competitive information to decision-makers [1]. BI can be applied in the game industry to improve marketing efficiency and save costs through effective decision-making. Marketing is defined by the American Marketing Association (AMA) as a set of processes for creating, communicating, and delivering value to customers and managing customer relationships in ways that benefit the organization and its stakeholders [2]. As for the game industry, marketing is the knowledge of creating value for prospective players and making potential players interested in games [3]. Zackariasson and Wilson [4] describe that it is vital to select a target audience and the right marketing strategies for game businesses. Wesley and Barczak [5] point out that it is hard to make games successful without a marketing budget, and it is also hard to get and spend the marketing budget effectively. However, how to do marketing promotion based on BI is hard for game developers, especially for independent (Indie) game developers who have fewer resources to do game development and also have little or no experience in marketing. Many indie game developers are good at game development, but most of them lack game publishing experiences [6]. They do not know how user acquisition works and how to transfer users into loyal and paying players [7]. As identified in our previous interview study, indie game developers face issues with marketing based

on data analysis during their game publishing [8]. They have issues with marketing promotion, such as how large the marketing budget to use for different channels, how to make new user acquisition, how to determine what kind of channels are suitable for user acquisition and how to improve marketing performance. BI has been applied in game development for game design and optimization, but few systematic research efforts focus on game publishing, especially for the mobile game publishing business [9].

This paper explores how to use BI for marketing promotion and addresses potential issues for indie game publishing. Indie game developers need to make the right decisions about marketing promotion during the mobile game publishing process. They need to evaluate which channels are the best for user acquisition and what needs to be improved for the next marketing promotion. Therefore, we apply and extend the existing ARM (Acquisition, Retention, Monetization) funnel model from social games to mobile games and provide a data-driven method for mobile game marketing promotion. In section 2, we discuss related work about game analytics and marketing promotion. Section 3 extends the ARM funnel model for mobile game publishing and proposes a data-driven method to evaluate marketing promotion performance, especially by differentiating between user acquisition channels. Section 4 provides the methodology for our research, which focuses on a case study of indie mobile game marketing. In section 5, we present the research process, which includes five steps. In section 6, we apply our method for indie mobile game marketing promotion and demonstrate how to collect the related data, do the data analysis and then propose actions to improve the marketing promotion for different user acquisition channels. Section 7 concludes how our method can be used for marketing promotion and discuss future research work.

## II. RELATED WORK

Analytics means the extensive use of data, statistical and quantitative analysis, explanatory and predictive models to drive decisions and actions [10]. Analytics is a subset of BI that uses data to understand and analyze business performance. It can be used to ensure that the money and resources devoted to marketing focus on the most effective campaigns and channels [11]. Drachen et al. [12] point out that game analytics can be understood as applying analytics to game development and game research. Game analytics is the process of identifying and communicating meaningful patterns that can be used for decision-making related to games. It has already been used in the game industry for many years, including identifying in-game design issues [13], visualizing players' behavior on a map [14], and also driving game development [15]. However, most studies focus on game development and game research, and less research focuses on the game

publishing side. As for mobile game analytics, Drachen et al. [16, p.3] point out that “*In essence, the field is in its infancy and the available knowledge is heavily fragmented.*” This is to be expected in the explorative phase of a new domain or a new artifact. It can guide indie game developers with mobile game publishing, especially on using game analytics for mobile game marketing.

As for game marketing research, Lobo [17] aims to use a data mining approach to enrich the marketing strategies required to improve game marketing promotion. This data mining approach is based on data revealing players’ inclination toward a particular game genre. Nummenmaa and Kankainen [18] identify the key social features in the marketing and promotional material of hybrid board games. The features are identified by exploring sources such as game websites and game boxes of hybrid board game products. Fields [19] points out that understanding the value of each player added to a particular game can help inform decisions about how to spend marketing money to attract new users. Prieger and Hu [20] investigate the indirect network effect in the marketing of video games. They examine the relationship of marketing choice between increasing demand by lowering console prices and encouraging game software variety. Sheu et al. [21] point out that the marketing activities have turned to create a pleasing experience for the players. The features of online games make it essential to apply marketing to the online game industry.

As for game publishing, Moreira et al. [22] use the ARM (acquisition, retention, and monetization) funnel model as the basic analysis for the game publishing business. However, the application of game analytics in game publishing, especially for game marketing, lacks systematic studies. The ARM funnel model is initially designed only for social game publishing which requires social interaction between players by the game company *Kontagent*. As shown in Figure 1, it includes the three stages: acquisition, retention, and monetization [23].

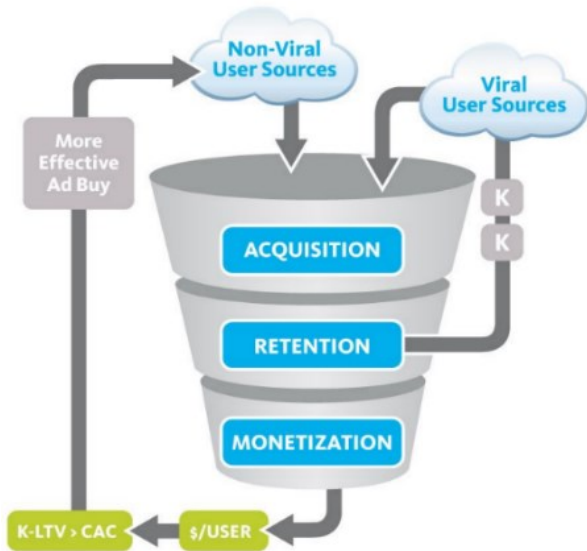


Fig. 1. ARM funnel model [23]

The acquisition for social games mainly comes from viral channels, which are more valuable to game developers because they help reduce user acquisition costs. The K factor

is a key indicator of game virality. It can show the number of players who join the game through viral sources. The ARM funnel model mainly focuses on the viral K factor promotion effect if K-LTV (Life Time Value) is greater than CAC (Customer Acquisition Cost). However, as mobile game publishing has many channels for user acquisition, evaluating different channels’ marketing effects and identifying the high-quality channels is vital compared with social games.

We apply and extend the ARM funnel model from social game publishing to mobile game publishing and propose a data-driven method for mobile game marketing promotion. The concept data-driven describes a business state where data is used for decision-making, and data-driven characteristics include well-integrated metrics and related algorithms [24]. In order to help the indie game developer find high-quality channels, we propose a new solution for free-to-play (F2P) mobile games as most mobile games choose this model. F2P model provides players a free version and offers purchases and upgrades or new features through micropayments. We find high-quality channels for marketing promotion by exploring the relationship between the channel, in-game players, and the revenue. We apply our method to an indie mobile game project, evaluate their marketing promotion and drive their mobile game publishing.

### III. EXTEND ARM FUNNEL MODEL FOR MOBILE GAME MARKETING PROMOTION

As for mobile games, there are many channels for user acquisition, such as Facebook, Twitter, and Google channels. Our method aim is different from the ARM funnel model, which only focuses on whether K-LTV is greater than CAC. We plan to find out the relationship between the channel, in-game players, and the revenue. As shown in Figure 2, we can measure the marketing promotion from two sides by different metrics. On the one hand, we bring and define the channel metrics obtained from the channel promotion. The channel metrics include the Cost Per Click (CPC), Click Through Rate (CTR), Conversion Rate (CVR), Cost Per Install (CPI), eCPM (Effective Cost Per Mile), and also the budget spent on this channel. These metrics can be collected through the mobile game user acquisition channels, such as Facebook, Twitter, and Google. On the other hand, we add the in-game metrics that can be used to measure in-game performance and determine the marketing promotion effects. These in-game metrics include install, paying player, revenue, Daily Active User (DAU), inactive player, and churn player. Besides combining channel metrics and in-game metrics, we also provide two different data analysis methods for marketing promotion evaluation. Based on the data-driven method with related metrics and analysis, we can comprehensively evaluate the marketing performance and provide indie game developers suggestions about their marketing promotion and drive actions.

We apply the ARM funnel model from social game to mobile game and focus on the marketing user acquisition part. However, the ARM funnel model focuses on the viral K factor promotion effect if K-LTV is greater than CAC. In order to help the indie game developer find out the high-quality channels, we extend the ARM funnel model with new metrics and analysis methods for the F2P mobile game marketing promotion. We utilize two different analysis methods, comparative analysis and correlation analysis. In practice, we separate IOS App Store and Google Play, the two mainstream mobile game distribution channels for data collection and data

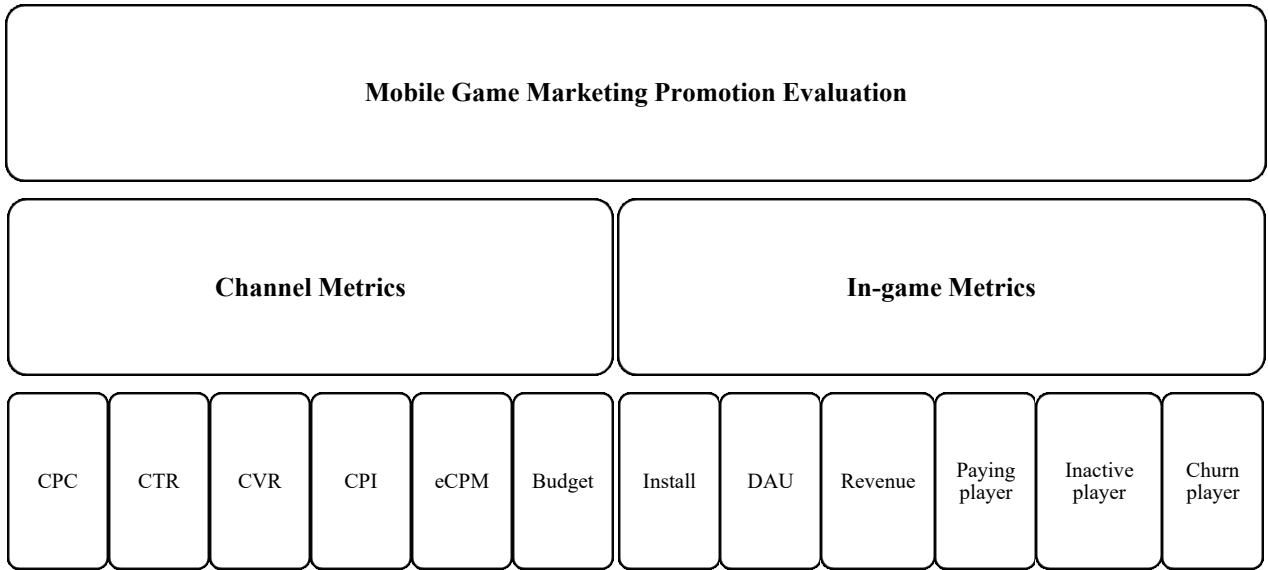


Fig. 2. Mobile game marketing promotion evaluation.

analysis. Usually, channel metrics can be used to analyze channel quality. For instance, if the channel has the lowest CPI, it will benefit the user acquisition. However, due to the fraud traffic and installs, there is a potential risk during marketing promotion if we only evaluate the channels' quality by channel metrics. Besides this, for F2P mobile games, the install does not equal a purchase, but rather profit is generated by a small subset of players in the game lifetime. Therefore, we need to consider the in-game metrics together with the channel metrics. We introduce the in-game metrics such as install, paying player, revenue, DAU, inactive player, and churn player. Then, we can combine the channel metrics and the in-game metrics to comprehensively evaluate the marketing promotion effects for F2P mobile game publishing.

#### IV. RESEARCH METHODOLOGY

The research focuses on applying BI for mobile game publishing marketing promotion. We first define the new metrics that combine the channel metrics and game metrics to evaluate the marketing promotion and then use two different analysis methods based on the existing ARM funnel model extension. During this research, we cooperated with an indie game studio based in Sweden. We worked and participated in one specific mobile game publishing project, where we applied our data-driven method for marketing promotion evaluation as a case study.

A case study is an empirical investigation of an individual case used to investigate a problem and discover the reasons behind the phenomenon. Yin [25] describes that case study research includes designing the study, collecting the related data, analyzing the data, and presenting it. Our case study cooperated with an indie game studio with fifteen employees and participated in their specific mobile games publishing project. The research focuses on the feasibility study that applies our method to their mobile game project for marketing promotion and drives their mobile game publishing. From the research ethics side, we got approval from the indie game studio to use related data and materials for research as long as we provide free guidance to their game project.

#### V. RESEARCH PROCESS

As for the research process, we apply our method with its related metrics and analysis to evaluate the mobile game marketing promotion performance by cooperating with an indie game studio based in Sweden. We demonstrate how our data-driven method can be used for mobile game marketing promotion by collecting and analyzing the related metrics, including the channels metrics and the in-game metrics. As shown in Figure 3, the research process consists of five steps.

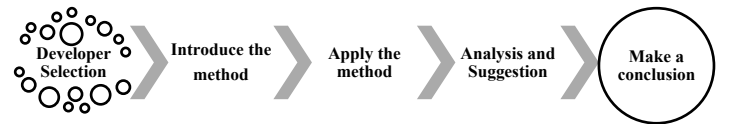


Fig. 3. Mobile game marketing promotion research process

- **Step 1 Developer selection.** According to the research goal, we plan to provide a data-driven method and guide indie game developers in marketing promotion. So we need to choose an indie game studio that mainly targets the mobile platform and starts marketing promotion for F2P mobile games. We were recommending an indie game studio based in Sweden with a new mobile game marketing requirement that matched well. After the first Skype meeting with their CEO, we learned that the indie game developer was eager to do the marketing promotion and reach the target players for a new F2P mobile game with a low budget. They plan the new mobile game with early access for marketing promotion, which constituted a suitable case.
- **Step 2 Introduce the method.** In the early stage of communication, to ensure that the indie game developer is interested in our method, the first author held an online meeting with the indie game studio and introduced the method and how it can be used for guiding mobile game publishing. In practice, the indie game studio was not

clear about evaluating marketing performance, especially regarding what data need to collect and how to do the data analysis. So, we introduce our data-driven method as guidance for the marketing promotion evaluation and explore the relationship between the channel, the in-game players, and the revenue.

- **Step 3 Apply the method.** In order to address the specific issues faced by indie game developers, the first author worked with the indie game studio and guided them to use our method in their game publishing to evaluate the marketing promotion performance. We give them related metrics to measure the marketing promotion and ask the game studio to collect these metrics, including the channel metrics and the in-game metrics. Besides this, we provide different data analysis methods for marketing promotion evaluation. The analysis methods guide them to analyze the collected data. We also explain to them why to involve these analysis methods for marketing promotion in our method.
- **Step 4 Analysis and suggestion.** We observe and analyze the performance after using our method for marketing promotion evaluation. In practice, after data collection, we use two different data analysis methods to evaluate marketing promotion performance. We also teach the indie game studio to compare the performance from different channels for user acquisition to find potential problems for each channel. Based on previous analysis results, we held another meeting with the game studio and suggested taking actions to improve the marketing promotion.
- **Step 5 Make a conclusion.** Finally, we summarize how to apply our data-driven method for the marketing promotion evaluation and make a conclusion.

## VI. DATA COLLECTION AND ANALYSIS

We take two approaches in the specific data collection, including channel data collection and in-game data collection according to our method. Then we can make a comprehensive evaluation of the marketing promotion performance for different user acquisition channels based on these data. For the data analysis, we provide comparative analysis methods to analyze different channels' promotion and correlation analysis to analyze all variables related to marketing promotion and explore the potential issues about each user acquisition channel.

### A. Data Collection

First, concerning the channel metrics, we suggest the indie game studio use the AppsFlyer, a third-party analytics tool, to collect the data about the user acquisition from advertisement click to game install. During the marketing promotion, the indie game studio chose Facebook ads to spend the marketing budget. All the new players come from the Facebook platform with IOS App Store and the Google Play game links. Besides this, the indie game studio focus on Canada (CA) and American (US) markets, and the marketing data mainly come from four Facebook channels. We collect each channel's promotion data according to the channel metrics during the whole marketing promotion. Then we calculate the total Clicks, Average CPC, Average CTR, Average CVR, Average CPI, and Average eCPM for each channel. Second, we also guide the indie game studio to collect the related in-game data during the marketing promotion. In practice, the indie game

studio collected all the in-game data from their game servers directly by querying data in the database.

TABLE I. MARKETING PROMOTION CHANNEL METRICS.

Channel	Total Clicks	AVG CPC	AVG CTR	AVG CVR	AVG CPI	AVG eCPM
Facebook Android CA Channel	1358	0.33\$	0.65%	0.18	1.26\$	3.15\$
Facebook IOS CA Channel	4895	0.61\$	0.43%	0.35	1.11\$	4.04\$
Facebook Android US Channel	886	0.45\$	0.72%	0.22	1.68\$	4.41\$
Facebook IOS US Channel	4082	0.53\$	0.62%	0.31	1.13\$	5.10\$

As shown in Table I, the average CPI for Facebook IOS CA Channel is 1.11\$, which is the lowest CPI compared with other channels. It seems that the marketing promotion from the Facebook IOS CA Channel is better than other channels. However, the average CPC for Facebook IOS CA Channel is 0.61\$, which is the highest CPC compared with other channels. If we consider the average eCPM performance due to the Facebook IOS US Channel having the highest eCPM 5.10\$, it is suitable for showing the advertisement. In short, it is hard to conclude only by these channel metrics without tracking the player's in-game performance. That means we also need to collect in-game data to evaluate further, as shown in Table II.

TABLE II. MARKETING PROMOTION IN-GAME METRICS.

Channel	Budget	Installs	Paying players	Revenue
Facebook Android CA Channel	657.90\$	380	9	98.77\$
Facebook IOS CA Channel	4334.19\$	2720	47	1201.86\$
Facebook Android US Channel	604.49\$	299	2	92.39\$
Facebook IOS US Channel	3244.18\$	1973	33	901.76\$

For the in-game data collection, considering what happens during the marketing promotion, we bring and select game metrics and collect the related data to measure the marketing performance, such as the game revenue, installs, and paying player. In the specific data collection, we collected the related data during the marketing promotion to ensure that this marketing promotion effect can be evaluated comprehensively.

### B. Comparative Analysis

The comparative analysis focuses on similarities and differences in values of variables, which is broken down into two types according to whether the aim is to explain differences or similarities [26]. Our comparative analysis mainly focuses on explaining the differences among different channels during the marketing promotion. We obtained all the

data to evaluate the marketing promotion according to the metrics defined by our method. We can analyze different channels' performance through the comparative analysis of these data, including the channel metrics and the in-game metrics, then provide a comprehensive evaluation for the marketing promotion. Since the new user acquisition cost from different channels and regions are different, we plan to analyze which channel should be the high-quality channel for the user acquisition, which channel is worth putting more marketing budget, and how to improve for the next marketing promotion.

- Channels metrics analysis

According to the channel metrics analysis, the Average CPI for Facebook IOS CA Channel is the lowest, which is only 1.11\$, as shown in Table I. The average CVR for the Facebook IOS CA channel is the highest, which reaches 0.35. It can be seen that the Facebook IOS CA channel has a good conversion from click to install with a reasonable cost for the player acquisition compared with other channels. However, the average CPC for Facebook Android CA Channel is the lowest, which is only 0.33\$. So, this channel should have the most economical cost for the ads click. From this case, we can see, based on these metrics, that it is not easy to determine which channel is the best for the marketing promotion. The main reason for the difference is that the user acquisition cost for different channels and regions is also different. Therefore, we can hardly draw a correct conclusion for the marketing promotion only by these metrics. In order to solve this problem, we need to combine the channel data with the in-game data for comprehensive evaluation such as install, paying player, and revenue.

- Install and paying player analysis

As shown in Table II, the Facebook IOS CA channel brings 2,720 new installs, which is the highest of all channels.

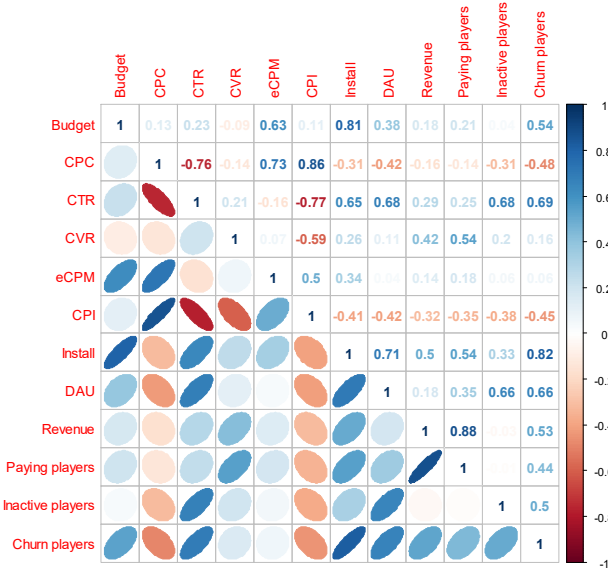
The Facebook IOS CA channel also gets 47 players who pay for this game. Compared with paying players from other channels, this channel should have a good performance in install and payment. However, the good performance in new install and paying players is also related to the marketing spending. We need to consider the revenue and marketing costs from these channels as well.

- Revenue and budget analysis

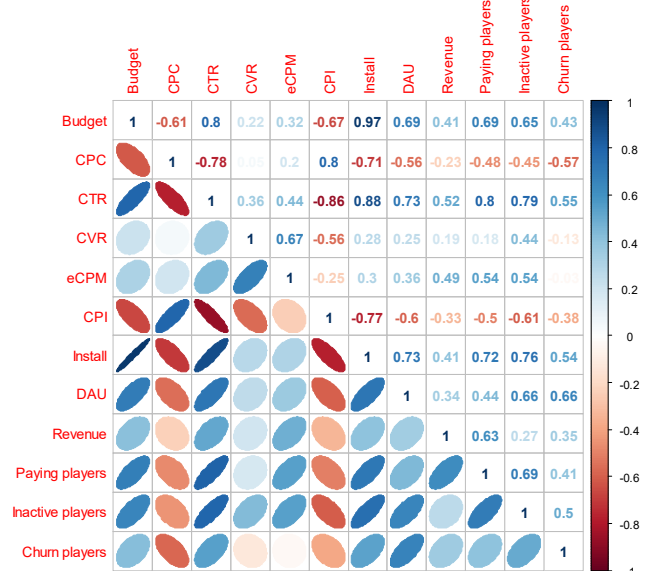
Revenue is an important metric to measure the quality of the channels for user acquisition. It can be used to evaluate if this marketing promotion attracts the target paying players. In practice, the revenue we collected is only the revenue during the marketing promotion and not the player's lifetime value. This revenue analysis can explore whether the marketing promotion finds the right players. As shown in Table II, through the channel budget, installs, paying players, and revenue comparison, it seems that Facebook IOS CA Channel has good performance compared with other channels.

### C. Correlation Analysis

However, for previous comparative analysis, which only focused on similarities and differences in individual variables' values, the relationship between different variables cannot be shown. Based on our method and the related metrics, we need to deeply explore the channel's relationship with the budget, the new player installs, active player DAU, inactive player, churn player, and revenue. As the marketing budget is spent for user acquisition, we need to determine if the budget contributes to the new install first, and then we focus on the install and find out if the install contributes to the DAU and revenue. We choose the correlation analysis method to show all the relationships about marketing promotion for different channels. The correlation analysis can help the game developer to analyze variables related to the game marketing promotion deeply.

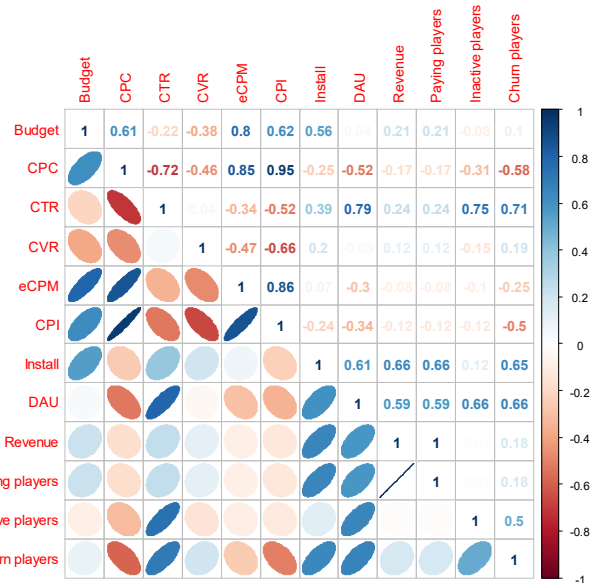


(a) Facebook Android CA channel

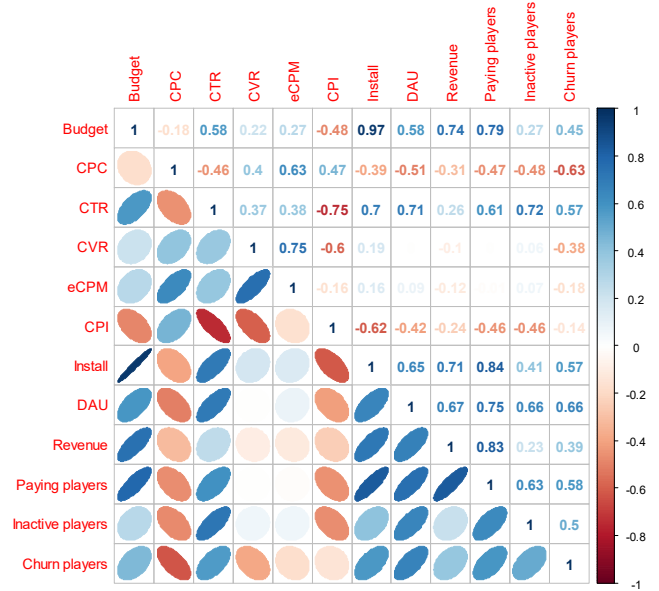


(b) Facebook IOS CA channel





(c) Facebook Android US channel



(d) Facebook IOS US channel

Fig. 4. Different channel promotion correlation analysis.

We calculate the Pearson correlation coefficient for the marketing promotion variables, including Android and IOS with CA and US channels, and plot the correlation figures shown in Figure 4 using R, a free software environment for statistical computing and graphics. For the marketing promotion correlation analysis, if the correlation between two variables is strong, the graph formed is closer to a linear distribution. Conversely, the graph is closer to the circular distribution when the variables are uncorrelated. The darker the graph, the stronger the correlation. Blue indicates a positive correlation, and red indicates a negative correlation. The graph composed of two variables corresponds to the correlation coefficient between the two variables. Besides this, we also calculate the P-value to validate the relationship between the two variables. The P-value is the probability that if the correlation coefficient was in fact zero (null hypothesis).

For the Facebook Android CA channel, the correlation coefficient between the Budget VS install is 0.81, as shown in Figure 4a. So that means for this channel, the marketing budget has the positive effect on the install. However, the correlation coefficient between the install VS churn players is also above 0.80. That means the install has a positive effect on the churn players as well. The correlation coefficient between the install and CPC is -0.31, and the correlation coefficient between the install and CPI is -0.41. So, the new install has no apparent relationship with the CPC and CPI.

For the Facebook IOS CA channel, the Budget has a strong relationship with the install as the correlation coefficient between the Budget VS install is 0.97, as shown in Figure 4b. So that means for this channel, the marketing budget has the strong positive effect on the install. The correlation coefficient between the install VS CTR is above 0.80. So that means for this channel, the install has the positive effect on CTR. However, the correlation coefficient between the installs and CPC is -0.71, and the correlation coefficient between the install and CPI is -0.77. So, we can find out that the new install has a negative relationship with the CPC and CPI.

For the Facebook Android US channel, the Budget has a relationship with the install as the correlation coefficient between the Budget VS install is 0.56, as shown in Figure 4c. So that means the marketing budget has a positive effect on the install for this channel. The correlation coefficient between the install VS DAU, install VS Revenue and install VS Paying players is above 0.60. The install variable has a close relationship with DAU, revenue and paying players as well. So that means for this channel, the install has the positive effect on the active player, revenue and also the paying players. However, the correlation coefficient between the install and CPC is -0.25, and the correlation coefficient between the install and CPI is -0.24. So, we can find out that the new install has a negative relationship with CPC and CPI.

For the Facebook IOS US channel, the Budget has a strong relationship with the install as the correlation coefficient between the Budget VS install is 0.97, as shown in Figure 4d. So that means for this channel, the marketing budget has the strong positive effect on the install. The correlation coefficient between the install VS paying players is above 0.80. So that means for this channel, the install has the positive effect on the paying players. However, the correlation coefficient between the installs and CPC is -0.39, and the correlation coefficient between the install and CPI is -0.62. So, we can conclude that the new install has a different relationship with the CPC and CPI.

In order to make it easier for indie game developers to analyze, the most relevant correlation coefficient with the install is compared. As shown in Figure 5, the correlation coefficient contrast provides a comprehensive evaluation of each channel's marketing promotion. We can make an in-depth evaluation about marketing promotion from the correlation coefficient between installs VS budget, install VS CTR, install VS DAU, install VS revenue, install VS paying player, install VS inactive player, and install VS churn player. In order to validate the relationship between these variables, we also calculated all the P-values, which show less than 0.05. If the probability is lower than the conventional 5% ( $P < 0.05$ ), it means the correlation coefficient is statistically significant.

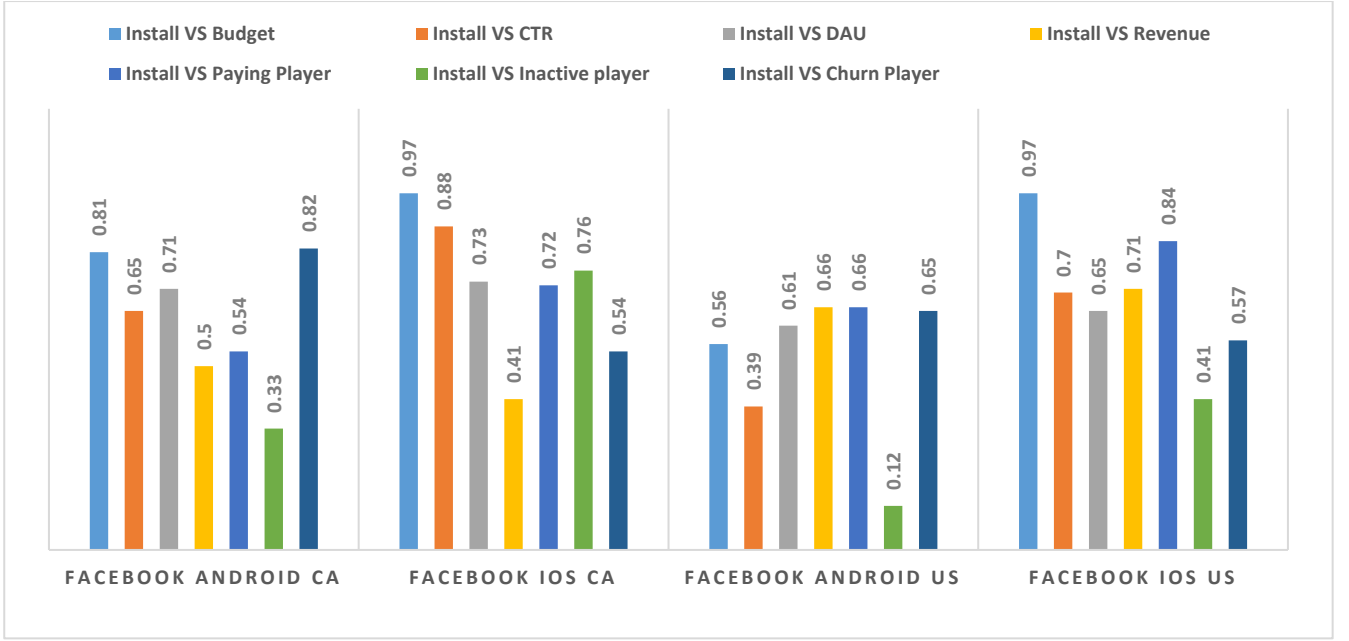


Fig. 5. Marketing promotion correlation coefficient contrast

Our research focuses on how BI can be used for game marketing, especially for indie game studios with limited resources to make the right decision for different user acquisition channels. Our proposed method can be used to evaluate the effect of mobile game marketing promotion on different channels. Based on the evaluation result, the next step is to suggest actions to improve.

#### D. Suggestions Based on Analysis

Based on the previous data analysis, in order to provide specific suggestions to the indie game studio, especially what they need to do for the next marketing promotion, we also suggest specific actions for each channel.

- As for the Facebook Android CA channel, the correlation coefficient between install and paying player has the lowest value compared with other channels. So, we suggest the indie game developer improve the monetization and increase the paying players by adding first payment rewards for new players and encouraging them to pay with big rewards. Besides this, the correlation coefficient between install and churn player has the highest value compared with other channels. So, we suggest the indie game developer decrease the churn player and avoid the new player churn by finding out the churn points and improve the in-game tutorials
- As for the Facebook IOS CA channel, comparing the correlation coefficient between install and budget, install and CTR, and install and DAU, we can see that this channel has the best performance for user acquisition. So, we suggest the indie game developer focus on the Facebook IOS CA channel and put more budget on this channel, which will bring more new players. Besides this, the correlation coefficient between install and inactive player has the highest value compared with other channels. So, we suggest the indie game developer reactivate the inactive players by sending game push notifications.

- As for the Facebook Android US channel, comparing the correlation coefficient between install and budget, install and CTR, and also the install and DAU, we can see that Facebook Android US has the worst performance. So, we suggest the indie game developer improve the marketing assets for this channel. In practice, we ask them to do AB testing with different marketing assets for this channel and improve the user acquisition, which needs to consider matching with the target users and reduce the cost.
- As for the Facebook IOS US channel, the correlation coefficient between install and revenue, install and paying player has the highest value compared with other channels. So, we suggest the indie game developer focus on the Facebook IOS US channel and put more budget on this channel to attract more paying players and deliver more revenue.

In short, based on the data analysis, we find potential publishing problems behind the data related to the marketing promotion. We also provide suggestions concerning how to improve marketing promotion and polish games according to channel performance. These suggestions include putting more budget on Facebook IOS CA channel for the user acquisition and also spending more marketing budget on Facebook IOS US channel for the game revenue, improving the marketing assets for the Facebook Android US channel, reactivating inactive player from the Facebook IOS CA channel by sending the push notifications, decreasing player churn from Facebook Android CA channel by churn points optimization. Besides this, we suggest the developer improve monetization by adding first payment rewards for the new players and increase paying players.

#### VII. CONCLUSION AND FUTURE WORK

BI has been applied in game development for game design and optimization. However, few systematic research efforts focus on game publishing, especially not on mobile game publishing [9]. This paper focuses on solving the mobile game



publishing marketing challenge from the indie game developer side. Most indie game developers lack experience in game publishing [6]. They do not know how to transfer users into loyal and paying players [7]. They have marketing challenges during the game publishing process [8]. We provide a data-driven method to guide indie game developers in their mobile game marketing promotion. The data-driven method means it makes decisions based on data analysis. In our case, the data-driven method provides the guidance to collect both the channel and in-game data and extract useful information by comparative analysis and correlation analysis and drive the actions about marketing promotion. Compared with the previous game marketing research [17-21], how to help indie game developers with mobile game marketing is meaningful. It is crucial for indie game developers to use BI to make the right decisions about which channels to put more marketing budget for user acquisition, revenue and solve potential problems for each channel promotion. We demonstrate the applicability of our method in one indie mobile game project. The result shows that our method can help the indie game studio to find out the high-quality channels by combining the channel metrics and the in-game metrics analysis. Moreover, based on the correlation analysis, they can identify potential issues in different channels and then take related actions to improve. In practice, we also did a small survey with the indie game studio, especially for our data-driven method used in their marketing promotion. They give the feedbacks that our method provides an easy and quick way of getting some insight into their marketing, and if it goes into the depth that is correctly used, a company can have major benefits from using it. They also agree that our method helps them on a high level to put more effect on potential problems from channel side and improve their marketing promotion.

In order to generalize our method for different indie game developers to use in the future, we suggest them spending a tiny budget to try with different marketing channels first, then based on the data-driven method, finding out the high-quality channels for the next step promotion and also choosing related actions to improve potential problems. In the current case, our data-driven method has been used for F2P mobile games. However, for Pay-to-play (P2P) model mobile games, as game developers only focus on download data, it is not easy to get more in-game data. So, future research needs to focus on guiding P2P mobile game marketing. Besides this, we plan to optimize our method for indie mobile game publishing and consider developing an analysis tool. The indie game players can upload their marketing data and then get the analysis result directly. Through our research, indie game developers can use a suitable way to drive their marketing promotion, find potential problems, and take more suggested actions to improve their game business.

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