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### **BUILDING A POPULAR MOBILE APPLICATION BY UTILIZING USER FEEDBACK**

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## Building a popular mobile application by utilizing user feedback (Conference Paper)

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### Abstract

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Developing a popular mobile application which is suitable to the users based on the input that users have given with their feedback is very challenging. There are many new mobile applications with high user feedback but few download rates. Moreover, some users of the application are unwilling to give their feedbacks. This abrupt state is caused by the carelessness of mobile application developers in noticing the importance of user feedback and user behavior. In this paper, we will state several steps and options that could be taken by mobile application developers to popularize their mobile application. This solution is mainly focused on the utilization of user feedback and user behavior, which also include proper use of feedback loop, great advertising, and behavioral change. The objectives of this analysis are to change unpopular mobile applications with high user feedback to become popular mobile application with high user download rate, as well as to encourage users to properly express their opinion regarding the application by giving out their feedback to the mobile application developers. © 2017 IEEE.

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# Building a Popular Mobile Application by Utilizing User Feedback

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**Abstract** – Developing a popular mobile application which is suitable to the users based on the input that users have given with their feedback is very challenging. There are many new mobile applications with high user feedback but few download rates. Moreover, some users of the application are unwilling to give their feedbacks. This abrupt state is caused by the carelessness of mobile application developers in noticing the importance of user feedback and user behavior. In this paper, we will state several steps and options that could be taken by mobile application developers to popularize their mobile application. This solution is mainly focused on the utilization of user feedback and user behavior, which also include proper use of feedback loop, great advertising, and behavioral change. The objectives of this analysis are to change unpopular mobile applications with high user feedback to become popular mobile application with high user download rate, as well as to encourage users to properly express their opinion regarding the application by giving out their feedback to the mobile application developers.

**Keywords** – Mobile Application; User Feedbacks; Download Rate; User Behavior; Feedback Loop; Behavioral Change

## I. INTRODUCTION

In this era of mobile technology, we can see the vast and rapid development of mobile applications for our daily activities [1] such as personal entertainment, education, office, religious activity support, etc. Today, more and more people are used to download mobile application for their own interest and purposes. Mobile applications or mobile app is defined as a software application that can be executed on a mobile platform, or a web-based software application that is tailored to a mobile platform [2]. There are many examples of mobile applications we can see on our everyday lives such as mobile applications for controlling smart devices, mobile application to help managing everyday task, or mobile applications that helps you to manage your financials activities. Thus, increasing the people engagement for mobile application so it becomes good opportunities for developers to produce or create a more interesting mobile application which can help people with their daily activities [3].

With the vast and rapid development of the mobile

application itself, the opportunity for application developers to create a good investment out of it is very large [4]. Therefore, application developers have to keep up with the information came from the users in a form of user feedbacks to identify how the users feel about the mobile application. The developers will catch the user's satisfaction based on user feedbacks about the mobile applications.

## II. USER FEEDBACKS

User feedback is one of the most important things for mobile application developers to be able to deliver an excellent application which is suitable to their users based on the input that the users have given with their feedback [5]. If feedback is used properly, it can become a very powerful influencing tools [6]. However, despite the critical value that user feedback holds towards the mobile application, many application developers often disregard the importance of user feedback [7]. In mobile application, there are two kinds of feedbacks that the user can give, which are:

- Review Comment
- Rating Score

Review Comment is a feedback that is given by the users in the form of an honest opinion, this opinion conveys what the users truly think and feel about the mobile application. This kind of feedback is very valuable for mobile application developers because it enables them to construct a viable action plans. By making use of the comment review that was given by the users, it becomes possible for the developers to direct the development of their application to become more suitable to what the users want [8].

Rating on the other hand, is a score that the users have given to the application that they feel to be the best to represent the likeness that they had towards the application. For mobile application developer, this kind of user feedback can be viewed as another approach of quality control and assessment analysis. Figure 1 shows an example how the users gave two different feedbacks for game mobile application named "Arkanoid vs Space Invaders", where user named Javier

Rodriguez gave 5 stars for his feedback whilst user named Jonas Emil Andersen gave 1 star for his feedback. That game mobile application as shown in figure 1 has 1.000 user download rate, a rating score of 4.7 from 146 user feedbacks.

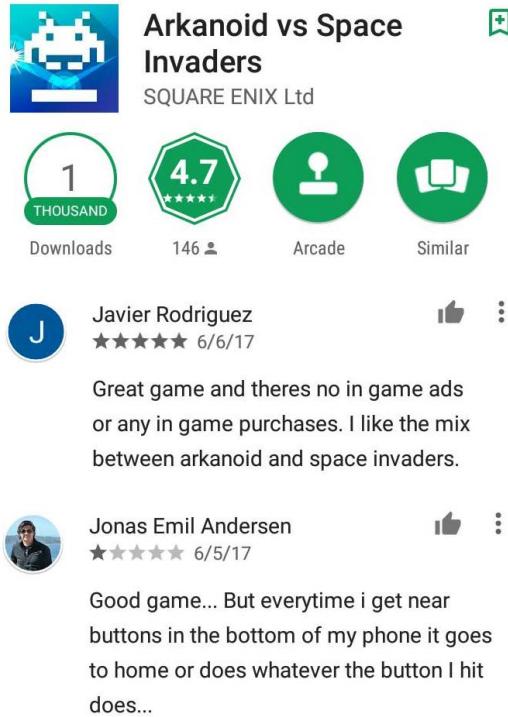


Figure 1 User Feedback and Download Rate of Arkanoid vs Space Invaders Game Mobile Application.

The most important requirement for mobile application developer is to build software which satisfies the user and turn it into a popular mobile application. It is because the more popular the application is the more recognition and profit that the developer would potentially get. Popularity of things is determined by the amount of people that drawn to it [9]. By that definition, we can conclude that a popular mobile application is recognized when it has a high download rate. Moreover, high download rate is influenced by user feedback which is shown as rating score and user positive feedback as well. However, there are some ambiguity when user with high star rating score but with negative comments and vice versa.

### III. USER FEEDBACK PROBLEMS

For popular mobile application with high user feedback should have high download rate score and vice versa. However, since there is significant different number score between download rate and user feedback rating, where user feedback rating score always less than download rate score, then the popularity of mobile application is influenced by bad user behavior which result in none feedback.

Next, the investigation will discuss and list the problems

in download rate and bad user behavior.

#### A. Problem in Download Rate

There are some new mobile applications that capable of drawing high user feedbacks, but they have few users download rate. We have analyzed some new mobile applications in *Google Play Store* and found several applications that has less download rate. This becomes a problem for mobile application developer that wants to build a popular mobile application. We must define a strategy for those mobile applications in order to elevate their popularity and make score high users download rate.

#### B. Problem in bad User Behaviors

The behavior of the user itself can become a problem when users are unwilling to give their feedback regarding the mobile application. The most common reason behind this predicament is because user feedbacks are not something that is forced towards the users. It is entirely optional for users to choose whether they want to give feedback or not. However, for mobile application developer to build a suitable application based on what the users want, they must know what their users truly think and feel about their application. Thus, they can strategize how to plan on developing their application to meets the need of the users. This will become problem for them when there are not enough user feedbacks to become with

Based on the previous descriptions, we are interested in investigating the user feedbacks problems correlated with download rate and user behavior and they are:

1. Mobile application with high user feedback but less user download rate.
2. User behavior of unwillingness to give their feedback.

### IV. BALANCING DOWNLOAD RATE AND USER BEHAVIOR AS USER FEEDBACK

Based on discussion regarding in the previous section, we can define two main problems of user feedback. In this section, we will be investigating those problems and explain each of the problems in detailed order.

#### A. Balancing download rate as user feedback

For application that already has high user feedback but low user download rate, one of the more visible key factors of retaining user interest is by utilizing a continuous feedback loop between users and the application developer [10]. The way to turn user feedback into a powerful tool to achieve mobile application popularity is by planning a solid strategy regarding utilizing feedback loop. Feedback loop is essentially a process of gauging the current state of the application, identifying changes, adjustment, and configuration needed, repeating it if necessary, in order to achieve goals. There are two types of feedback, “*positive feedback loop*” and “*negative feedback loop*”, both can help tremendously in boosting the application popularity [11]:

- Positive feedback loop: Process of utilizing user feedback to increase the distance between the “reference values” (undesired state) with the current state of the application.
- Negative feedback loop: Process of utilizing user feedback to reduce the distance between the “reference values” (desired state) with the current state of the application.

Both feedback loops are not only act as a booster for the application popularity, but it also helps them in retaining the user satisfaction. Feedback loop can help developer into shaping the application to become more suitable into what the customers want. Each type of the feedback loop involves in a sort of motivational force, negative feedback loops has an *attractive* attribute, while the positive feedback loop has an *assertive* attribute. Simply put, developer can employ negative feedback loop to pursue situation that they want and positive feedback loop to avoid situation that don't want (maintaining user's' interest).

For new mobile applications that already has high user feedback but less user download rate, the mobile application developers can try to properly utilize these feedback loops to create a “reference value”. They can utilize negative feedback loop to build things that the users expect from the application and utilize positive feedback loop to avoid doing and adding things that the users wouldn't like.

There are several phases of Feedback Loop. To build a mobile application that fulfil the users want application developers must implement each phases of the feedback loop in rapid succession [12]. These phases are:

1. Collecting and Consolidating Feedback: Collecting all user feedback and turned into a usable form (Categorizing positive and negative feedbacks into tabular form).
2. Analyzing Feedback: Analyze feedback to find any existing or potential issues as well as its impact to the users (constructing reference value).
3. Reporting Analysis Result: Result gained from feedback analysis is rewritten into a structured report to make it easier for the decision-making process.
4. Decision-Making: Making decisions from the recommendations from the reporting phase that best representing what the users want.
5. Delegation and Communication: Ensuring that all the people involved with the implementation of the solution to be aware of all the requirements for the changes to be implemented.
6. Implementation: Applying the changes to the application based on the decision made. It may involve a period of testing to ensure that the right solution is applied to reach what the customers want.
7. Result from last implementation is collected again from the newest User Feedback.

A successful implementation of feedback loop would provide the mobile application developer with a suitable strategy to gain more popularity. Hence, it can also increase the number of their user download rate. Sometimes, certain mobile application needs more than just feedback loop to drastically change the number of its user download rate. However, there is another way to increase download rate of the application and increasing the effectiveness of feedback loop at the same time. It is by implementing a proper use of marketing. In next section, we will be discussing marketing as a way to popularize mobile application and increasing the number of user download rate.

The other method to increase the number of user download rate is by increasing the amount of good marketing. What considered as good marketing is marketing that can gain high user feedback and high download rate in the most efficient way possible. Moreover, marketing is a practice that focuses on creating and delivering value to the users to ensure user interest [13]. Having marketing communications enables a company to connect a brand with people, places, experiences, feelings, and other things. They contribute to the brand awareness of company's products by placing the brand in people's memories [14]. Which means, marketing is a method to direct the user interest into the willingness to download the application. Good marketing can also serve as a secondary means to increase user feedback, because marketing is all about trying to build connection between your application and your users. It takes new marketing strategies and innovation in improving the performance of marketing department of a company in order to be able to compete well [15]. One type of marketing that is suitable in increasing user feedback and download rate is advertising.

Advertisement is an attractive communication message that serves two basic functions: to inform and to persuade [16]. Informing is telling users that this mobile application does exist and providing information regarding the functionality that the mobile application has. This is important because, when there is no information transfer regarding the mobile application existence to the users, it'll become very wasteful for the mobile application because no one will really know how good of an application it truly is. Meanwhile, persuading is telling the users why they need the mobile applications and why they should download it. The goal of persuading is by telling things that the users would like to hear regarding the mobile application hence making them interested in downloading the mobile applications. Mobile applications need to be supported by good and effective advertisements, such as on websites and social media where a lot of potential users are gathered. When people are finally exposed to the mobile applications and they are successfully persuaded into believing in the excellence of the application, they will have the urge to download the mobile applications and giving their feedbacks about the mobile applications in return. For example, some of the better ways to advertise your mobile application are [17]:

- Having a Website: Making an online presence for the mobile application, informing the users regarding its legitimacy.
- Creating Social Media Account: To get in touch with the users and act as advertising channels that share news to the users.
- App Store Optimization (ASO): Making it possible for the mobile application to appear on the search result of the users that would like to search a specific application with a certain keyword.
- Viral Marketing: Encourage users to share information about the mobile application via the Internet thus greatly boosting the application popularity.

However, there is a crucial factor to be considered in advertising. This crucial factor is where to put the advertising in order to reach the correct targeted users. Selecting channels that will be used as the medium of the communication is very important in doing advertising. If the users are unfavorable towards a channel and perceive it as disturbing, it may negatively affect the perception of the users regarding the communication message that the developers are trying to convey [18]. Therefore, it is crucial to be wise on the advertisements so it will not be considered as disturbing for the users. For example, if your advertisements always showing on every video perhaps in YouTube video people might be annoyed by the too much advertisements and may negatively effects the mobile applications image, and users may not necessarily want to download it because of the advertisements that they find disturbing.

### B. Balancing user behavior as user feedback

The second problem occurs when user rejects to express how they feel regarding the application, thus becoming users that reject to give their user feedback. They only downloaded the applications without giving any form of user feedbacks. In order to find out the performance of user behavior in mobile application we proposed Feedback Index (FI) score as seen in equation (1). FI score has important signal to developer in order to maintain and extend their mobile application. High and low FI scores have significant and insignificant feedbacks respectively, for developer to maintain and extend their mobile application.

In equation (1), TUD (total user downloads) is the number of downloads that the mobile applications have. While TUF (Total of User Feedback) is the total amounts of users that has given the mobile applications feedbacks in a form of ratings and review comments. TRS (Total of Rating Score) is the number of score the user gives. Ration between TUF and TUD will be multiply with TRS in order to find FI score.

$$FI = \frac{TUF}{TUD} TRS \quad (1)$$

Where:

- TUF = Total of User Feedbacks
- TUD = Total of User Downloads
- TRS = Total of Rating Score
- FI = Feedback Index

For example, we use print screen two contradiction mobile application as seen in figures 2 and 3 respectively. In figure 2, mobile application Puffin Web Browser has 421,812 amounts of user feedbacks (TUF), 10,000,000 total download rates (TUD) and 4.2 rating user score (TRS). On the other hand, on figure 3, mobile application UC Browser has 14,257,129 amounts of user feedback (TUF), 100,000,000 total download rates (TUD) and 4.5 rating user score (TRS). Next the detail of equation (1) implementation on both figures 2 and 3:

- FI score for figure 2

$$FI = \frac{TUF}{TUD} TRS = \frac{421812}{10000000} 4.2 = 0.1772 = 17.72\%$$

- FI score for figure 3

$$FI = \frac{TUF}{TUD} TRS = \frac{14257129}{100000000} 4.5 = 0.6416 = 64.16\%$$



Figure 2 Puffin Browser User Feedbacks Data

Based on the calculation for Puffin Web Browser and UC Browser, it is clearly possible to see the difference of results. A high result of feedback index is preferable for the mobile application developers, if the feedback index is low means that it is a bad sign for developers. Because the lower the results number is, the more people are unwilling to give their feedbacks, that affect the ratings because the developer is lack of user feedbacks to guide them in improving the mobile application. It will also affect the amount of user downloads because people are more interested in higher rating mobile applications than the lower rating mobile application, this will be a problem for developers to make their mobile application successful.

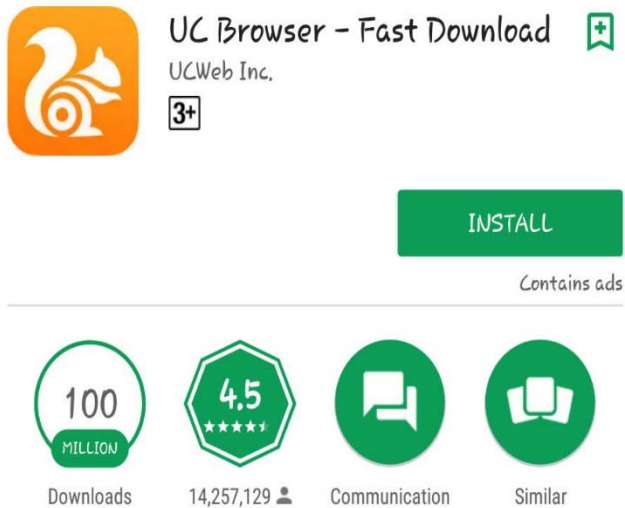


Figure 3 UC Browser Feedbacks Data

Meanwhile, user rating score as shown in TRS has significant influence as well, where mobile application with low user rating score (TRS) will make lower the FI score which categorized as bad mobile application. For example, let say figure 3 has TRS=2 and it will have FI score 28.51% and it will not far different with FI score 17.72% for figure 2 but with TRS=4.2.

- FI score for figure 3 with TRS=2

$$FI = \frac{TUF}{TUD} TRS = \frac{14257129}{100000000} 2 = 0.2851 = 28.51\%$$

The solution for the problem is finding another creative way to encourage users to give out their user feedback. To understand and engaging the targeted audience of the mobile applications in a proper way, mobile application developers must take a careful notice on their user behavior.

To engage the users and to obtain feedbacks we need to understand their behavior. For example, if the mobile applications are looking to appeal to the age range of 3-8 years old, developers must understand their user behavior such as these users might not necessarily understand what feedbacks for. Those particular user's actions may be strictly restricted to application use only. For example, whenever they like certain mobile applications, they will use it or play with it, but if they don't like it they will not use it anymore. We can engage users in all sort of different ways, such as implementing user feedbacks on the mobile applications itself that is designed to capture the young user's attention, such as using funny pictures instead of words and giving them rewards whenever they were asked to rate the application. So, despite having young users as targeted audience we still can receive feedbacks by applying behavioral changes to make them give their user feedbacks.

In the context of the definition, behavioral change is the process of altering, maintaining or encouraging the cessation of a specific activity undertaken by the targeted audience

[19]. This implies that it is possible for developers to change the old behavior of their users. From the last example of young users only use the mobile applications without giving user feedbacks, behavioral change can appeal them into giving user feedbacks by creating a fun experience for them.

It is necessary to realize that there is more than one path to engagement and that the different paths are realized by offering different experiences [20]. This behavioral change can be applied to other types of situations where the user is unwilling to give their feedbacks because of the hassle to open the *Google Play Store* just to submit their user feedbacks. To solve it we can create the feedbacks to be submitted in the mobile applications itself so that it will reduce the amount of works that the users need to do to give their valuable feedbacks and giving an easy experience to the users.

Other effective solutions for many cases are we give them a reward for giving their feedbacks such as extra credit for their mobile games or mobile applications, unlock some functionalities in the mobile applications. Moreover, we can add some extra trial time for the mobile applications to engage the users and make them to share their feedbacks because of the rewarding experience they are going to get and feel after that, or we can also use responsive feedbacks where the developers answer and tried to solve the problems with the users such as shown on figure 4. In figure 4, the developers answer the user feedbacks from user named IINightFangIII for problem that the user had found on the mobile applications named vainglory, then the developers inform the users that they received the feedbacks and what to do to make it better and other problems that might bother the user to make them experienced that they are a priority for the developers.



Figure 4 Vainglory Developer's Responsive Feedbacks

## V. CONCLUSION

To be able to overcome the disadvantage of having a new mobile application with high user feedback but few user download, as well as having to deal with users that are unwilling to give out user feedback, mobile application developers must take notice on several important things. They must monitor and analyze the result that they have gained from user feedbacks with feedback loop. They can utilize negative feedback loop to develop application that the users want and utilize positive feedback loop to avoid things that the users wouldn't like. They must plan a good marketing strategy to engage their customer.

A popular application is hard to get without proper advertising process. By utilizing advertisement in an effective way, it is guaranteed for those that have high interest and good impression towards the application to download it. And lastly, they must understand their users completely. When they know who their exact application users are, they can formulate an interactive method to engage their users effectively. If things were done properly, users will undergo a behavioral change and having an increase on the interest that they have towards the mobile application. Users will feel the need to express their honest opinion via user feedback, which eventually lead a successful building of a popular mobile application.

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