Understanding the factors that influence the popularity of mobile applications - A comparative study between Android apps and IOS apps

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Abstract

Technological advancements especially in the mobile field have started to demand the need for mobile applications to not just survive but thrive in the business world of today. There is an inherent need to be fast, cheap and efficient to conquer the mobile market. In order to be durable, there is a need to understand the factors that affect the popularity or likeability of these mobile apps among the users. Rating in the app distribution platform is a significant performance metric for measuring how well an app is doing in the app market. It is important to explore the factors which affect the popularity in order to develop competitive applications, understand where to invest time or money, and succeed in the business world. This research presents a case study, involving quantitative studies performed on the two most leading mobile markets - Google Inc.'s Play store and Apple Inc.'s App store. Thus, our approach is to perform quantitative data analysis on these stores with a desire to effectively investigate and communicate the findings of this case study.

Keywords: Mobile applications, Mobile apps marketing, Mobile software engineering, Software popularity.

1. Introduction

The ubiquity of mobile apps in everyday life make them an attractive source for mining digital knowledge (Liu, et al., 2018). Mobile apps are software applications that are designed for hand-held smart phones, tablets and other smart devices. Present day mobile phones are almost an extension of

a human body and numerous apps form the backbone of the mobile device to enable users to perform their day to day tasks. These apps are developed by software developers and distributed to the users using an application distribution platform. Google Inc. and Apple Inc. with their Play Store and App Store respectively are the biggest players in the app markets (Annapurna, Teja, & Murthy, 2016). Mobile apps are being developed in diverse areas such as education, business, health, finance and entertainment and are distributed as either free or paid services.

App development is usually market driven (Lim, Bentley, Kanakam, Ishikawa, & Honiden, 2015). Although the developers and product experts put extensive efforts into market research to understand the end user needs for their apps, it is often challenging for them to guarantee user satisfaction. During the development of the app, the developers have limited exposure to the potential users. Success of an app is often perceived by the number of downloads, daily active users and average rating of the application (Lim, Bentley, Kanakam, Ishikawa, & Honiden, 2015). However, accurately measuring the success of a software system is difficult as there is neither a universal metric nor a ranking scheme (German, 2007).Therefore, this study is aimed at trying to understand different factors that influence the popularity of mobile applications and also draw some comparisons between user behavior of Android and IOS apps.

2. Literature Review

The benefit of mobile apps is evident. However, there is a need to understand which factors specifically contribute to the success of mobile applications. This section presents the related literature of mobile applications, their popularity with respect to Android and IOS devices.

Understanding which characteristics influence the high rating of mobile applications is crucial (Tian, Nagappan, Lo, & Hassan, 2015). Tian et al. discuss in their study, that 28 factors with 8 dimensions could be potentially associated to app ratings - a measure of popularity in their study. According to them, three of the 28 factors have a major influence on the app rating - install size of an app, number of promotional images, and target SDK version. Tian et al. considered only free apps for their research purposes which may not support in generalizing the results to all apps of Android platform.

Lee et al. performed a study on the top 300 apps in the Apple's App store and examined how factors at different levels affect the app's survival

in the top 300 charts. Furthermore, they found that providing free applications, investment in relatively less popular categories and constantly providing updates on app features increase sales performance (Lee & T. S, 2014). However, the study only focused on the longevity of the app and not on the factors that influence the success of the app.

In addition, there have been several researches on the app user behavior for mobile applications based on country. App market is an extremely competitive market where the sale margin is low(Lim, Bentley, Kanakam, Ishikawa, & Honiden, 2015). App users behavior differs significantly across countries and have different expectations in various geographical locations (Lim, Bentley, Kanakam, Ishikawa, & Honiden, 2015). Lim et al. only focus their study on country as a factor for popularity and do not discuss the other factors.

To encapsulate all of these findings of several researchers and understand the factors that contribute to the popularity of mobile applications at a high level, we have designed this study.

3. Research Methodology

3.1. Purpose

The purpose of this study is to understand what factors influence the popularity of mobile applications with respect to the two most popular mobile ecosystems - Android's Play store apps and Apple's App store apps. Following are the research questions that we have attempted to answer in this study.

RQ #1: Does popularity correlate with the characteristics of an app like number of installations, number of images displayed and number of ratings? This investigation is essential to check whether these factors can be improved to increase an app's popularity.

RQ #2: How does popularity vary per genre, application size, and price? The goal here is to provide an initial view about the popularity of the apps, by comparing the average user ratings within the groups of genre - Sports, Health, Education etc., application size - Small, Medium or Large, and price - paid or free version of the application.

RQ #3: How early in time do apps get popular? With this research question, we intend to check whether the gains in popularity are concentrated in specific phases of a app's lifetime, specifically in early releases.

RQ #4: What is the impact that new versions have on popularity of an application? This study can demonstrate if relevant gains in popularity happen due to new versions of the application.

3.2. Methodology

This study is a case study on mobile applications and application distribution systems. Case study is mainly chosen as the research methodology, as it is the most widely used research methods in information systems research (Darke, Shanks, & Broadbent, 1998). It is well suited to understand the interactions between information technology-related to innovations and organizational contexts (Darke, Shanks, & Broadbent, 1998) (Myers, 1997). Thus, we study the existing popular application distributed system, scrape data from it and examined it in a way to identify the causality of popularity amongst them.

This study is conducted as a two-part simultaneous case study where the Android's Play store and Apple's App store are examined simultaneously to observe the behavior of users in each of these systems. Consequently, we have chosen the mobile app rating in the respective stores as the unit of measure for popularity in our analysis.

Moreover, the purpose of most researches is to generate a theory and prove it (Norman, 1991). It can be achieved by either qualitative data collection which is concerned with words and meanings or quantitative methods which are concerned with numbers and measurement (Yin, 2009); or sometimes combination of both. Since our study involves human behavior, verification cannot rest on intuition, argument, or opinion (Norman, 1991); therefore, it was decided to base our verification on quantitative data analysis with a desire to effectively investigate and communicate the findings of this case study with a stimulating and valuable report.

Biographies

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Poornima Joshi is a graduate student in the Data Science Program at The George Washington University.

Dr. Nima Zahadat

Nima Zahadat is a professor of information systems and computer science. He has also held positions as Chief Security Officer, Chief Information Officer, Director of security, Director of Training Solutions, Dean of Computer Science, Program Chair of Information Systems, and Director of Operations. Dr. Zahadat has worked extensively with public and private sectors throughout the years.

Dr. Zahadat has taught at George Mason University and the George Washington University in the fields of information systems, engineering, data science, web development, and security. He has developed and taught over 100 different Information Systems, Security, and Project Management curricula throughout his career. He has an undergraduate degree in Mathematics from George Mason, a graduate degree in Information Systems from George Washington, and a Ph.D. in Systems Engineering and Engineering Management from George Washington.

Dr. Zahadat's research interests are mobile security, information security, digital forensic, risk management, data mining, and information visualization.

Dr. Zahadat enjoys biking, photography, travel, skiing, and writing.

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