Detecting Fraud in the Mobile App using 3-R Evidence Aggregation

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Abstract

Mobile applications (apps) are software developed for use on mobile devices and made available through app stores. App stores are highly competitive markets where developers need to cater to a large number of users spanning multiple countries. This work hypothesizes that there exist country differences in mobile app user behavior and conducts one of the largest surveys to date of app users across the world, in order to identify the precise nature of those differences. And the country wise fraud detection in the mobile app is detected using ranking, rating, review of an app and the fraud in the mobile app is done by the fraudulent with the help of bot farms and the main characteristics of fraud app duplication of data, gathering information without user knowledge and app ranking algorithm is used to detect Fraud in the mobile apps.

Keywords: *Requirements/specifications, market-driven software engineering, mobile application development, survey research, app user behavior, fraud detection , ranking, rating review and app ranking algorithm.*

I. INTRODUCTION

MOBILE use on mobile devices such as smart phones and tab- apps are software applications developed for lets. Once developed, an app is sold via an application distribution platform, commonly known as an app store. App development is market-driven. Similar to traditional market-driven software, the requirements for an app are usually derived from strategic business goals or from market opportunities. During the development of an app, developers have limited contact with potential users. Success is measured by the number of downloads and revenues generated from the app. The app store concept has democratized the software industry almost anyone can build and sell apps to a worldwide population of users via app stores.

The benefits of app stores come with significant challenges. App developers face a crowded and highly competitive app market, and as a result, an app can fail (receive little or no downloads) due to features unrelated to its functionality and usability, such as app name, app icon or level of exposure. As the profit margins from app sales are small,an app should ideally appeal to a large number of users worldwide in order to be successful. However, many developers are unaware that users from different countries have different behavior and needs, and that these factors affect app downloads.1 There is also a lack of awareness about the importance of features such as app description, screenshots, pricing, and user feedback. These challenges have caused many apps to fail. Studies have found that 400,000 out of 600,000 apps in the iOS App Store have no downloads and 80 percent of paid Android apps received less than 100 downloads.

Despite these failures, app development continues to accelerate worldwide. Market-driven software engineering has been studied in the past, but today researchers are increasingly focusing on the new opportunities and challenges of app development. Recent studies have made advances in our understanding of app user behaviors through mining app store data, gathering user activity logs and surveys. These provide useful data relating to specific smart phones, app stores, apps, app categories (e.g., medical apps), countries, or age groups. However to date there has been little research that studies global user behaviors in different app stores and mobile devices, comparing across countries.

II. LITRETURE SUVERY

A. User Feedback

App stores such as Google play or apple app store allow user to submit feedback in the form of rating and review to download application. By the user rating and review mobile application grows at high speed in past few years. And the platform became more popular to both application developer and users. The feedback content is inspected from the user feedback and analysis its impact on the user community. User feedback is given by the rate with its stars and a review message. Such feedback allows for a user driven quality assessment and marketing. There are three types of Feedback., Feedback Usage. Feedback Content, Feedback Impact.

B. *Checking App Behavior*

CHABADA starts with a collection of 2200 good app downloaded from the Google play store. Later using latent dirichlet allocation (LDA) on the app descriptions identifies the main topics like map, weather etc for each application. Then it clusters application by related topic .In each cluster identifies the APIs each app statistically accesses. Using unsupervised one class SVM anomaly classification it identifies outlier with respect to the API usage.

C. *Modelling the Effects of Publicity in Mobile App Ecosystem*

In mobile app ecosystems, an app can behave like a virus. Once downloaded, it may cause its user to recommend that app to friends who then may download the app and "infect" other friends. App eco models the app store, app developer, apps, user and their behavior. App eco is the first agent based model as experimental tool. The model consists of agents that are abstractions of app users and developers, as well as artifacts that are abstractions. App eco component consists of app developers, apps, users and the app store.

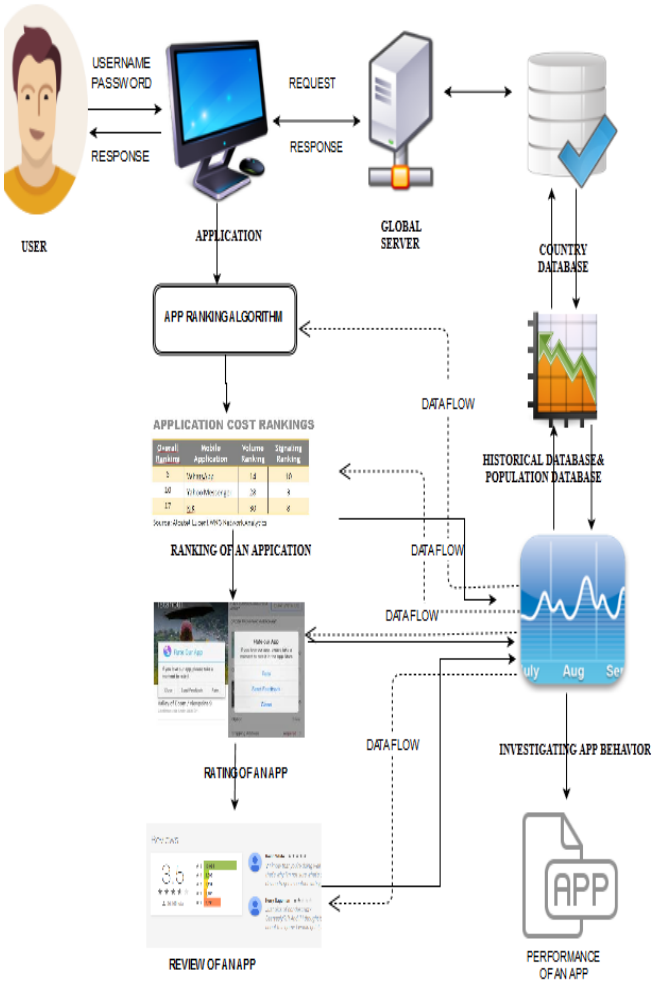
D. *Investigating App Store Ranking Algorithms using a Stimulation of Mobile app Eco System.*

App store are one of the most popular ways of providing content to mobile device users today .But with the thousands of competing apps and thousands new each day , the problem of presenting the developer apps to users becomes non trivial .It investigates app store content organization using app Eco, an artificial life model of mobile app ecosystem. App eco is used to investigate how best to organize the top apps chart and new app chart in ios app store.

E. *Personalized Mobile Application Discovery.*

The mobile application market has seen explosive growth in recent years, with Apple's App Store boasting more than 40,000 applications and Google's Android Market also having well above 15,000 applications. A recent study, the mobile application market will reach $17.5 billion by 2012.The number of mobile application downloads will have also grown to nearly 50 billion from just over 7 billion in 2009.In this collaborative filter algorithm to make personalized recommendations. App employs a client-server architecture, where its client collects the application's usage records and periodically uploads them to the server.The App server run the CF algorithm that calculates recommendations for all users on a daily basis.

III. SYSTEM ARCHITECTURE



IV. PROPOSED SYSTEM

- In the proposed system focus on preprocessing Natural language processing.
  - i) only English.
  - ii) remove "stop word".
  - iii) stemming
  - iv) removing non – text(html links, email address,…)
- Hashing tricking method is used efficiently discover which word make a user class click on articles and can track changes due to online nature.
- Appazaar recommender system which is used to provide much information about user task and intentions.
- To improve the usability and Conduct a user study of the app , which is an important Factor that the users often consider whether to continue Using application.

- In the proposed system App eco is used to investigate how best to organize the top apps chart and new app chart in android app store

ALGORITHM:

APP RANKING ALGORITHM:

*Pop t=MinPop+(Maxpop-Minpop)/1+e$^{\delta}$*t-D*

EXAMPLE:

POP minuser=1500

POPmaxuser=40000

Duser=-4.0

Suser=-0.0038

t =1

*pop t=1500+(40000-1500)/1+e-0.0038*1-(-4.0)*

*=1500+38500/1+e-0.0038*1-(-4.0)*

*=40000/1+e-0.0038*1-(-4.0)*

=40000/1+e-0.0152

=40000/1+2.7030

=40000/3.7030

=10802.0523899.

Weighted 4-day downloads in decreasing score

Score=8D1+5D2+5D3+3D4

Weighted 7 days download in decreasing score

Score=4D1+3D2+2D3+D4+D5+D6+D7

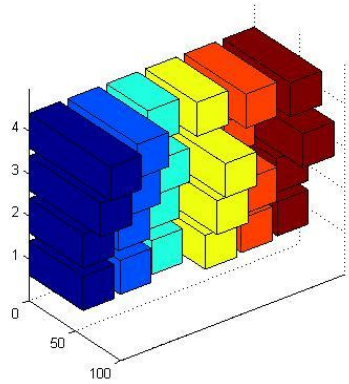
The population growth of user and developer agents is modeled using a sigmoid growth function commonly used to model the population growth in natural system.

The population size at timestamp t,pop t and min pop is the minimum population, max pop is the maximum population ,S is negative for a growth curve and D shift the curve from left to right and Dn is the number of downloads they have received from the current day.

V. PERFORMANCE EVALUATIONS

A. Experimental Setup

Previous research in cultural differences in organizations and technology usage by Hofstadter et al led to our hypothesis that country differences may exist in app user behavior. The results in Section 5 confirm the hypothesis and in addition highlight specific differences for each country in terms of app user behavior. Section 6.1 analyzes the country difference results by comparing them with Hofstadter's work. Findings with the literature in market-driven software engineering in order to identify new challenges and to inform our discussion of their implications for software engineering



B. Country Differences

While some differences are related to historical or technological legacies as in the case of app store awareness in Japan (Section 5.4), the causes of other differences are perhaps more complex and difficult to track. The differences in user behaviors are largely independent of GDP—when ranked in order of differences, the rankings do not correspond to the relative wealth of those countries. Our results indicate that country-specific differences exist in almost all categories: users from the United Kingdom are most forgetful about their apps and most influenced by price, users from Japan prefer not to rate apps, users from China are more likely to select the first app on the list more than any other, users from Mexico think that paid apps have more features, and users from Germany and Russia are more likely to download reference apps. In order to understand the differences, we measured the correlation between app user behavior and Hofstede's cultural index as follows.

1) Power Distance Index (the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed.

2) Individualism Index (the preference for a loosely knit social framework in which individuals are expected to take care of themselves and their immediate families only)

3)Masculinity Index (masculine societies have clearly distinct emotional gender roles: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life),

4) Uncertainty Avoidance Index (the degree to which the members of a society feel uncomfortable with uncertainty.

5) Long-Term Orientation Index (the fostering of virtues oriented towards future such as persistence and personal adaptability).

6) Indulgence Versus Restraint Index (indulgent societies have a tendency to allow relatively free

gratification of basic and natural human desires related toenjoying life and having fun, restrained societies have a conviction that such gratification needs to becurbed and regulated by strict norms).

VI. CONCLUSION AND FUTURE ENHANCEMENT

Mobile apps are software developed for use on mobile devices and made available through app stores. App stores are highly competitive markets with a rapidly increasing number of apps, and developers need to cater to a large number of users due to low margins per sale. In this study, we conducted one of the largest surveys to date of mobile app users across the world. We demonstrated that app user behavior differs significantly across countries, a result that was shown in other domains but never before in app-based software engineering, indicating that app developers should carefully consider the countries of their target users also investigated user adoption of the app store concept ,their app needs, and their rationale for selecting or abandoning an app. Through analysis of the survey results, identified new challenges to market-driven software engineering related to packaging requirements, feature space, quality expectations, app store dependency, price sensitivity, and ecosystem effect, and their implications for software engineering research in terms of research directions and tool development have released the results of our survey to the app developer community and received feedback that the insights are very useful. Some developers have requested for other countries to be studied as they are building apps for those countries. We anticipate that the new challenges identified in this paper can guide software engineering researchers towards the development of tools and techniques to improve market-driven software engineering for mobile apps.

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