Research on Crowd-based mobile application testing platforms

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Abstract—**In recent years, mobile applications market develop rapidly. In this paper, a research is provided for platforms of crowd-based mobile app testing.The infrastructure, framework, work flow of crowdsourcing for mobile applications are explained in this paper.**

Keywords-Crowdsourcing; testing platforms; work flow

I. INTRODUCTION

Because of the wide application of crowdsourcing, it has received extensive attention in the academic circle in recent years. Many experts and scholars have made a summary of the relevant research work on crowdsourcing in top conferences and periodicals. Ke Mao studied the applications of the crowdsourcing in the life cycle of software engineering[2]. Doan categorized the crowdsourced systems according to the type of problem and the way of cooperation[3]. Zhao Y summarized the research status of crowdsourced technology and predict the future research area[4]. Additionally, there is a small amount of content related to mobile application testing. Jerry Gao[5], Kirubakaran[6] gave the basic concepts of mobile application testing, and analyzed the needs, challenges and main problems of mobile application testing. However, they didn't combine mobile application with crowdsourced testing. In this paper, we focus on the applications of Crowdsourced testing technology in mobile applications. We then introduce the concept and advantage of crowd-based mobile application testing. Next, we study three key issues, and conclude open issues and opportunities for future research on crowd-based mobile application testing.

II. NORMAL CROWDSOURCED TEST INFRASTRUCTURE

Crowdsourced testing needs intermediary to connect mobile app developers with thousands of crowdsourced testers. The normal infrastructure for most of crowdsourced mobile test platforms is shown in Figure 1.
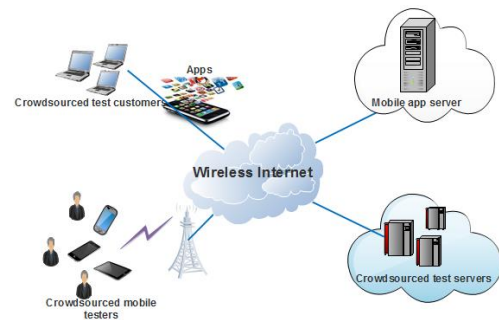
Figure 1. Crowdsourced Test infrastructure

Crowdsourced test customers upload under-test mobile apps, assign test requirements & criterion, and submit test tasks to crowdsourced test servers.

Crowdsourced mobile testers apply and execute mobile test tasks, and report test results to crowdsourced test servers. Crowdsourced mobile testers may be professional test engineers, or normal mobile users.

Crowdsourced test servers manage under-test apps, test tasks, and crowdsourced testers, assign test tasks to crowdsourced testers, collect test results, and generate test bills.

Mobile app servers communicate with mobile apps on mobile devices through wireless networks, and provide information and services for mobile apps.

III. CROWDSOURCED TEST FRAMEWORK

Crowdsourced test server provides test services using crowdsourced test approaches. As shown in Figure 2 below, we present a recommended framework for Crowdsourced test server, which includes a set of management services, a set of test services, and mobile test device cloud.
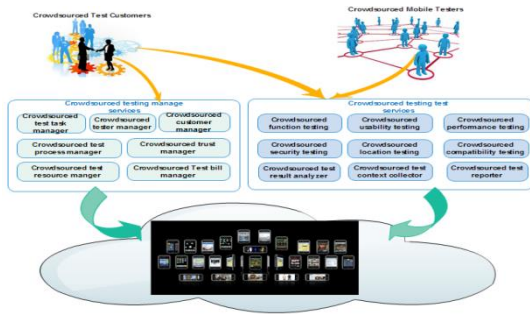
Figure 2. Recommend architecture for crowdsourced test framework

There are seven management services: crowdsourced test task manager, crowdsourced tester manager, crowdsourced customer manager, crowdsourced test process manager, crowdsourced trust manager, crowdsourced test resource manager and crowdsourced test bill manager.

Crowdsourced test server provides various types of crowdsourced test services, including function testing, usability testing, performance testing, security testing, location testing, and compatibility testing. There are also three supporting services, including test results analyzer, test context collector, and test reporter.

Mobile test device cloud provides test resources for crowdsourced test services. Crowdsourced mobile testers can use test devices in cloud to perform test tasks.

IV. WORK FLOW

Tthe main steps of crowd-based mobile application testing are: crowdsourced tester management, crowdsourced customer management.

A. Crowdsourced Tester Management Process

As shown in Figure 3, there are five core steps for crowdsourced mobile tester management.
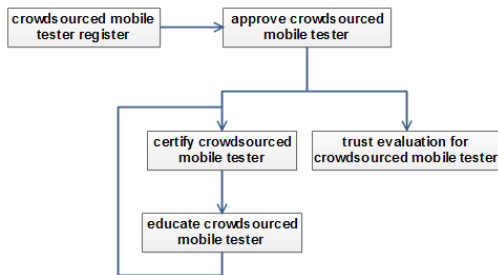

Figure 3. Core steps for crowdsourced mobile tester management

Step 1, crowdsourced mobile tester register. Testers submit basic personal information and test experiences, and apply to be crowdsourced mobile testers.

Step 2, approve crowdsourced mobile tester. Crowdsourced test server investigates information about crowdsourced mobile testers, and approves or denies the applications.

Step 3, certify crowdsourced mobile tester. Crowdsourced test server evaluates the abilities of crowdsourced mobile testers, and then certifies the levels for testers. The levels of testers will affect their payments.

Step 4, educate crowdsourced mobile tester. Crowdsourced test server provides training courses for crowdsourced mobile testers to improve their test skills. After they have finished the training courses, crowdsourced mobile testers can apply for certifying higher levels.

Step 5, trust evaluation for crowdsourced mobile tester. Trustworthiness of crowdsourced mobile testers will be evaluated by checking dishonesty in test results.

B. Crowdsourced Test customer management process

Crowdsourced test customer management include three core activities:

Step 1, crowdsourced test customer application. Customers submit basic personal or corporate information, and apply to be crowdsourced test customers.

Step 2, crowdsourced test customer approving. Crowdsourced test server investigates information about crowdsourced test customers, and approves or denies the applications.

Step 3, trust evaluation for crowdsourced test customer. Trustworthiness of crowdsourced test customer will be evaluated by checking if he is paying for crowdsourced mobile testers honestly.

V. CONCLUSION

The infrastructure, framework, work flow of crowdsourcing for mobile applications are explained in this paper.As there are more constructions and deployments of mobile apps on devices, more research on key technology of crowdsourced testing should be given.

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