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Mobile OS Compliance

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Management summary

Before any app or game is released on a mobile OS, it needs to go through testing that determines whether the app/game follows the guidelines of the mobile operating system. Since the target deadline to release the app is already published, the app has to undergo and pass the mobile operating systems guideline test and is then made available to users.

The target release date may be missed if the app does not adhere to the guidelines and need to be re-submitted. Some of the common reasons behind the app failing the guidelines test are not enough coverage over the number of devices, and not being tested against the latest guidelines or under the complete scope of the guidelines for the mobile operating system.

Introduction

Technology is evolving ever faster and is now revolving around smartphones and mobiles. Smartphones have become almost an everyday essential given the number of apps released with mobile access. Looking at the requirement to provide access on the go, many companies are now releasing their apps and games on mobile. However, with all this comes the responsibility to provide a defect-free and secure app to the customer. To fulfil this responsibility, leading mobile suppliers and operating system providers have put some mandatory guidelines in place. Every app supplier is required to comply with the guidelines before being able to release their app/game to online stores. Keeping these pre-defined guidelines in mind, we have created the OS Guidelines Checklist which will help app developers to successfully meet the guidelines following submission to the operating system providers.

Market – current status and outlook

The release of apps/games onto the market is increasing in volume. Many companies, from healthcare to construction, banking to insurance to email service providers, release apps on mobile devices. According to Statista, the number of apps/games released on iTunes every month has increased from around 19,500 to 47,000 between 2012 and 2014 [1].

For Android, the growth in the number of apps in the store has risen by 200 % [2].

Alongside the increased number of new app/games, we need to look at updates for existing apps/games. These are released to adjust to the new operating systems as well as to keep pace with the competition.

With the increasing demand to access favourite apps/web apps on mobile devices, the number of applications to be ported to mobiles is also rising. Plus, the frequent releases of mobile operating system and operating system updates increase the frequency of updates and maintenance required for all existing apps already on the OS.

All these releases and updates are required to comply with the operating system guidelines. Failing to meet the standards of the mandatory guidelines of the OS means missing the release date/schedule which potentially results in a huge monetary loss. With continuous app releases to stores, there is a chance of a similar app being released to the market earlier and gaining a majority market share.

Failing the guideline requirements also means additional costs have to be borne for the fixes and the re-testing. The app then needs to be resubmitted for the guideline test.

Figure 1 and Table 1 display the share of the different mobile operating systems currently in the market. It also depicts the increase in usage of Android phones in the smartphone market. With this growing popularity there are also more apps being developed to be released on these phones. Before these apps are released to the app stores, they need to go through the rigorous compliance tests of the operating system.

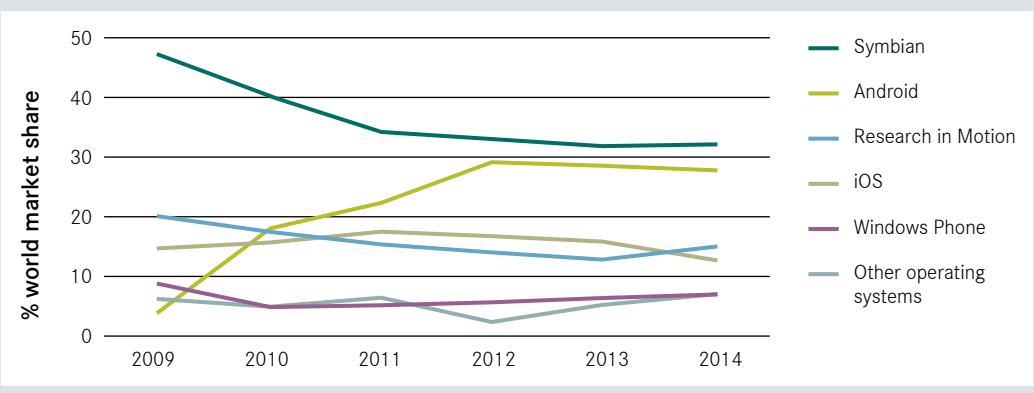

Figure 1: Smartphone OS market share (based on Gartner and IDC figures) [3]

Operating System	3Q14 Units	3Q14 Market Share	3Q13 Units	3Q13 Market Share
Android	250,060.2	83.1%	205,243	82.0%
iOS	38,186.6	12.7%	30,330	12.1%
Windows	9,033.4	3.0%	8,916	3.6%
BlackBerry	2,419.5	0.8%	4,401	1.8%
Other OS	1,310.2	0.4%	1,407	0.6%
Total	**301,009.9**	**100.0%**	**250,296.8**	**100.0%**

Table 1: Worldwide smartphone sales to end users by operating system in 3Q14 (Thousands of Units) [4]

Challenges for publisher/developer

Publishers/developers often face challenges when releasing apps to the stores. We have outlined the major challenges below.

The mobile operating system providers have guidelines that the developers need to follow. The apps are released to the store and to the end customer only when the app has cleared the submission guidelines. The reasons for the app failing the guideline test are if it doesn't follow the guidelines, i.e. buggy apps, its content is not suitable, copied apps/images, beta versions of the app, etc. Every aspect of guideline compliance needs to be checked across the app to ensure it is bug-free and in a state where it passes the compliance test.

In addition to testing the app for the required functionalities, the tester needs to verify the mobile-specific functions to ensure the app is bug-free.

Understanding the guidelines for each operating system provider and getting the guidelines checked for all the operating system versions and varied mobile devices is a challenge. This is required so that the tester is aware of the functionalities to be checked across the app.

The guidelines, functionalities and frontend of the app have to be checked over a range of devices. These combinations of devices need to include varied operating system versions. This ensures that the app is tested for compatibility with the recent OS updates available in the market. To test the app on varied combinations of operating systems requires a mobile testing lab. This lab needs to have a variety of mobile devices with a combination of varied operating system versions. Procuring and maintaining the different devices and the varied OS combinations represents a considerable cost.

SQS solution

To overcome these challenges, SQS has implemented generic solutions consisting of a checklist, a device library, an experienced team and a standard reporting mechanism.

1. Checklist

- Before being released to the OS app store, functional testing of the app is carried out, which ensures that it meets functional requirements. In addition, the app is also tested for performance to ensure that it will be able to handle the expected load. The functional and performance testing of the app ensures that a bug-free app is released.
- To ensure that the app follows the guidelines laid down by the mobile and operating system provider, mobile guidelines testing is carried out. The OS guidelines checklist is executed to ensure the app follows the guidelines. This checklist sets out the tests for all the guidelines. It includes tests to verify that the guidelines as specified by the mobile and operating system provider are adhered to by the app. Executing tests against the checklist ensures full coverage of the test scope per the guidelines.
- With every new version or operating system update released, the guidelines change and testing is required to comply with the changed guidelines too. To ensure that the app complies with latest guidelines, the checklist is updated to include the modifications. As the OS guidelines checklist is updated with every new update/release of the operating system, the app is tested under the most recent guidelines of the operating system.
- To receive the latest updates for the guidelines, SQS is registered with iOS Dev Center and the Windows Developer Program. Access to the Dev Center and the Developer Program also gives access to the beta versions of the operating systems.

2. Device library

- The functionality and the guidelines need to be verified over multiple mobile devices. This involves testing the app over varied mobile device configurations and different display resolutions. The functionality of the app also needs to be verified on devices with different mobile operating systems. To ensure that the functionality of the app and the operating system guidelines are tested over a variety of device/operating system combinations, SQS maintains a mobile testing lab. The lab currently has multiple devices with more than 150 mobile device/operating system combinations. The mobile lab is updated to include the latest iOS, Android and Windows mobile devices and releases. In addition to updating the lab with the latest devices, the devices in the device lab are updated with the latest operating system on release.
- Access to the iOS Dev Center and the Windows Developer Program grants access to the beta versions of the yet-to-be-released mobile operating systems. Testing the app/game on the beta version of the operating system verifies the app's compliance with the operating systems before it is released to the market.
- Frequent updates in the device lab ensure the device is fully tested per the operating system combinations.

3. People

- The OS guidelines checklist is executed by more than 150 mobile testing experts, many of whom are experienced in testing games and apps on mobile devices. Team members are specifically trained to execute the OS guidelines checklist. The mobile test team performs functional testing and device-specific testing to ensure that the app works correctly and complies with the OS guidelines as stated by the providers.
- The team members have proven experience in testing apps and games to verify both functionality and compliance with guidelines.

4. Reporting

- Defects observed during functional and guideline testing of the app are reported in the defect tracking tool. The defects observed against guidelines state the particular guideline details with which the app does not comply. For functional defects and crashes, the crash logs are attached to the defects to ensure the developer has a full set of information.
- Once fixed, the defects are regressed. This ensures that the application is defect-free and complies with the guidelines of the operating system.
- At the end of each day, the team sends a detailed report of the test execution which includes the team size, the tasks carried out by the team, defects reported, defects regressed and details of the guidelines against which the defects are reported.
- A detailed report and results are sent out on completion of the test.

A sample reporting sheet including additional details is depicted in Figure 2.

Application Certification Requirements for Windows Phone 8

Updated Date:
Updated by:

All apps and in-app products must comply with the certification requirements specified in this section before they can be published in the Windows Phone Store. The certification requirements are divided by type, such as app policies, content policies, and app submission requirements. Each applicable certification requirement contains test steps that you can use to test your app ahead of time.

CONTENT

Certification requirement categories
App policies for Windows Phone
Content policies for Windows Phone
App submission requirements for Windows Phone
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Additional requirements for specific app types for Windows Phone

Xbox Games
Xbox Games: Game technical certification requirements for Windows Phone

Xbox Terminology for Windows Phone
Xbox on Windows Phone

Updated Requirements	
Date:	
The following requirements were updated for this release: # App policies for Windows Phone # Content policies for Windows Phone # App submission requirements for Windows Phone # Additional requirements for specific app types for Windows Phone	

Figure 2: Sample reporting sheet

Relating the SQS approach to the common guidelines

The common OS guidelines predefined for the major OS manufacturers are as mentioned above. Apps need to be assessed to check that they follow all the guidelines in these areas.

- Functionalities: The app is expected to work correctly and be bug-free. The performance as described by the developer of the app and mobile devices is also stated in the functionality section of the guidelines. The correct functioning of the app must be tested on a variety of devices with varied configurations and operating system versions.
- Push notifications: These guidelines check that notifications in the applications have the user's consent, that they are not circulating confidential or unsolicited messages and that no offensive language is being displayed.
- Game centre: Game centre guidelines relate mainly to the game ID and game centre terms. The user has an ID that is required to log in to the game on the device. On signing in to the game centre, the user is assigned a game centre ID. The game centre ID is to be used for multi-player games, to save data from one device to another, etc. The guidelines state that only the game centre ID should be shared and not the login ID. Sharing the login ID may cause rejection.
- Media content: This section of the guidelines covers the media used in the application and the limit of the media usage therein. The current limit of the media that can be used in an app is 5 MB or 5 minutes per video. The app is also required to use the media player framework to play the video.
- Violence: The guidelines restrict any violence in the application or game. They also restrict the realistic depictions of weapons in such a way as to encourage illegal or reckless use of such weapons.
- User interface: The app as run on any device should follow the guidelines set out by the operating system manufacturers. The buttons and icons should display correctly as stated in the guidelines and should not alter the switches such as volume up/down or ring on/off. The most important requirement is that the user interface should be user-friendly and easy to understand.
- Purchasing and currency: These guidelines highlight the use of in-app purchases in the game or application. In-app purchases should be allowed only from operating system manufacturers' market places (App store, Google Play and Windows store).The user should be able to access the in app purchase for that game or application from any device which has the same OS.

A few defect examples can be used to demonstrate the power of systematic compliance checks in the mobile app and games field:

- For one of the games that the team tested, a freeze was observed only on a specific Android phone with the 4.4.2 KitKat OS. This defect was reported along with the specific device identified. The defect was spotted thanks to the keen eye and experience of the tester which was supported by the variety of devices in the bank that helped to confirm that the particular defect was observed only on a specific device/operating system combination.
- Push notification example: During execution of the guideline-based checklist, one of our experts observed that the push notifications on the application did not work when the user pressed the Home button on the device. The user noticed that the notification tray was empty and the application failed to send any push notifications at that stage. The defect was a critical one for the publishers and was flagged up as a result of the expertise of the tester and the checklist prepared by the SQS test team.
- Game centre: The execution of the checklist played a vital role here. The tester was executing game centre test cases and noted that the game was displaying an alphanumeric ID instead of a game centre player name. The tester was testing the multi-player game and was checking to see whether a third party could see the user ID instead of the game centre ID. This was a critical find and was fixed by the developers immediately.
- Media content: User acquisition is the display of ads while the user accesses the app. During user acquisition testing, the team was looking for the ad which should appear in a particular way after completing the levels in the game. The tester observed that the ads were not displaying properly and not appearing on the screen as expected.
- User interface: This is the most important section in the guidelines as user interface plays an important role in an application's popularity. While testing user interface scenarios for one game, our tester observed that the 'Back' button icon was missing from the screen, thus preventing the player from moving back and causing a major block in the game.
- Purchasing and currency: Another important section in the guidelines involves test cases for purchasing and currency. A defect or glitch in this area can affect the monetary side for the publisher. The SQS team was testing a game in which the in-app purchase played a major role. The tester observed that the game was awarding double the amount to the user when the user relaunched the game after purchasing the particular coin pack and quitting the game.

Conclusion & outlook

Systematic functional testing of the app/game is carried out and the OS guidelines checklist is followed to verify the compliance of the app with the operating systems guidelines. Offshoring of mobile testing requires investment, in return for which the publisher of the game/app can be sure that the app meets the guidelines set out by the operating system provider. This also ensures that the app does not miss the deadline due to rejection by the operating system provider, and is released on the scheduled date. It is always beneficial to run these OS guidelines checklists before submitting the application/game to the operating system providers.

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