**Mobile testing on real devices vs emulators**

We human beings allowed the mobile phones in our lives more than they would have ever been imagined to be allowed. If one can carefully look at the chronicles of mobiles ever since they were invented, there is no doubt that we will be awed. Started with calling and texting now there isn’t anything that mobile can’t help these days such as capturing movies, photos, using internet, games and lot of mobile applications that helps us interfacing with the market.

So after very much understood the above trend, industries have started giving more importance to design applications that operates on mobile platform too. All most all domains such as banking, retail, finance, travel..etc have been focusing on the mobile applications to target the most of the users. One of the biggest reasons for this success is mobile being a portable one and can perform operations by presenting anywhere.

We also have plethora of mobiles from various companies with various software versions and supporting formats and there exists a cut throat competition. Given the crowd of the platform, how the industry or product company should be prepared enough to design and test then launch a mobile application is the main lore of the blog.

Before we get there let’s just give a read of mobile of what is **mobile application testing**

It is the process of testing an application in order to find the possible number of bugs that is set to operate on a mobile device.

**How to test a mobile application**

This is a million dollar worth question but basic though. So far we have been commenting about the mobile device and its applications but didn’t discuss the way to test it. It is known that when we have to test a normal web, enterprise application we might need to put the URL in browser then test, need to open the installable application and test.

In a similar way to test a mobile application we need to install the application in mobile then start testing it like the way we use it. The solution is simple but we have a significant overhead here, we have already discussed that there are a quite lot of device with different operating systems are available.

Now, the question is how to test the application on those many number of mobile phones before it get launched. Testing of the application without comprising the quality is very much needed as that’s the thing to either help gaining or losing reputation. Keeping that in mind, possible questions those can arise would be

* Should we procure as many numbers of devices as available to test software?
* Should we test one or two then imagine it will also work on other applications?
* Do we have any alternatives i.e. kind of simulation tools to test them all at minimal cost?

In order to help with better timelines and cost effectiveness and quality testing for some reason we should have set up for all three questions. We should consider using mimicking tools to perform testing to an extent then rest of the testing can be done through the real device. We will further deep dive to understand the purpose of each one of them.

The software we have to use to test mobile applications are simulators and emulators. Both of them however can be grouped as one, but it’s good to discuss to understand their own capabilities.

**Simulators**

These are the tools that are installable on a computer so that these tools can mimic the basic mobile phone operation. These come with the partial implementation of the software. These are best used when we want to test the basic behaviors of the device such as functionalities within hardware or firmware.

**Emulators**

Emulators are the mimicking tools, which deals with external operations of the object. Emulators can be considered as high end tool than the simulators. This can mime the external operations like app usages and feature testing. These can also act as platform to set up various operating systems and devices. Emulators can provide better results than simulators.

This will come in the package of SDK for mobile where the entire required infrastructure needed for mobile testing can be made available

**Usage**

Both of the above discussed tools can be used in below scenarios

* When we want to validate the functional behavior of the applications on too many devices and we have no provision of all the required mobiles
* This software can be used to imitate the basic internal and possible external functionalities of the application
* These are more preferable in the early stages of the application development, to find the maximum number of bugs and also to prevent.

**Testing on real devices**

This is nonetheless the same as using the mobile device like the way user uses. The application that has to be tested must be installed on the device then start using it. This gives more space for testing the end user scenarios and several context based events which were not possible in the above mentioned tools.

* Though we have tested with the available software still there are lot more scenarios that can only be tested on the devices to ensure better working software. The need for real device testing arises due to the following needs
* We are not testing the real system through software. Real testing can only happen on the mobile device as simulators are just the ones who mimes the behavior
* There are chances to have flakiness and false positives and negative when we are testing with the tools, this can be ensured when we test on real device
* The multitasking scenarios can’t be tested with the help of tools, validating with mobile is more reliable as it proves the performance of the application
* Any core hardware related functionalities related to battery performance any audio and video experiences can be best validated with the use of mobile.
* Screen resolution, color contrast verification can’t be done with the help of tools that must be done with the help of device.

**Conclusion**

We understood by the above theory that all 3 are solutions are helpful in some or other means. Now the focus must be on how to use those tools and techniques. As there are pros and cons for every methodology we should focus on deciding when to use what and at what level and frequency. Here is the conclusion

Use the tools early in the life cycle to help with development and early testing, this basically benefits us from cost as not all projects may not have budget to procure the number of mobiles. We can help with proceeding the testing by miming the various operating systems

As all scenarios can’t be tested such as user actions and certain device specific hardware verification can only happen through the real device testing. So given the need we should conduct the selective testing on mobile phone at later stages to ensure the user experience is great and all real functionalities are working intended.