



Mobile Testing Nirvana



MOBILE APP ACCESSIBILITY TESTING GUIDE

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INTRODUCTION

A World Health Organization (WHO) report states that over 1 billion people i.e. about 15% of the global population currently suffer from various disabilities. This number is increasing with ageing population, and rising prevalence of non-communicable diseases. It also recognizes that inaccessible environments create barriers that often hinder the full and effective participation of persons with disabilities in society, on an equal basis with others.

Governments have been enacting various laws in order to protect the rights of people with disabilities (the differently-abled) and help them integrate into society. An inclusive society is a more productive and humane society, and hence it's important to promote equal opportunities.

In the area of communication, the dizzying number of Web and Mobile Apps are evidence of how important apps are for day-to-day living. Today, Mobiles have almost reached the level of life's essentials! However, for the differently-abled who form 15% of the world's population, Mobile App accessibility does not come as easy as for those blessed with all their faculties. An inclusive society cannot and must not exclude this important section of the world's population; and here is where the role of Accessibility Testing gains great importance.

Worldwide there are various regulations in place to make apps accessible for those with diverse disabilities. In the US for example, regulations like Web Content Accessibility Guidelines (WCAG), and the Americans with Disabilities Act (ADA), were framed to protect the interests of the differently-abled. These have seen fines ranging from USD 75,000 - USD 150,000 being imposed for non-compliance!

Accessibility Testing which tests app accessibility for those with various disabilities, increases universal access to apps and is therefore the solution whether the agenda is inclusivity, legal compliance, or increasing market share. This Whitepaper will therefore explore this important and pertinent subject.



ABSTRACT

Accessibility Testing can be viewed as 'inclusivity testing', as its purpose is to make apps accessible to all – including the differently-abled who have diminished levels of cognitive, visual, hearing, and mobility-related abilities. Currently the differently-abled make up 15% of the world's population, which makes Accessibility Testing as vital as Functional, Performance, API, and all other testing. Undoubtedly, it's in the interest of every app, that Accessibility Testing is incorporated throughout the software development life cycle (SDLC), right from design. It is also prudent to automate Accessibility Testing in order to make it cost and time effective.

This Whitepaper will explore Accessibility Testing by reviewing it in three parts.

The first section named '**What is Accessibility Testing**', presents a comprehensive understanding of Accessibility Testing and covers various aspects related to it.

The second section named '**Why is Accessibility Testing Required**', evaluates the importance of Accessibility Testing in today's world and its relevance in meeting diverse goals, focusing attention on 3 significant agendas:

- Promoting an Inclusive Society
- Meeting Legal Compliances
- Improving App Productivity

The third section named '**How to Achieve Effective Accessibility Testing**', covers the following:

- Guidelines for Mobile App Accessibility Testing
- Important Criteria/ Methods for Efficient Accessibility Testing
- Systematic Approach for Effective Mobile App Accessibility Testing
- Steps for Automating Mobile App Accessibility Testing

It is hoped that this Whitepaper will promote more awareness of Accessibility Testing, which is an essential and yet oft ignored aspect of Mobile App Testing.



WHAT IS ACCESSIBILITY TESTING?

Accessibility Testing is the practice of confirming that an app is accessible and usable by all people, even by those with cognitive, visual, auditory, physical, or mobility-related disabilities. It is also required to confirm that an app's accessibility information can be discerned, and the user interface operated. Accessibility Testing is a positive step in the direction of building a more inclusive society by offering equal communication opportunities to the differently-abled, with the intention of combatting any discrimination in the app world, based on disabilities.

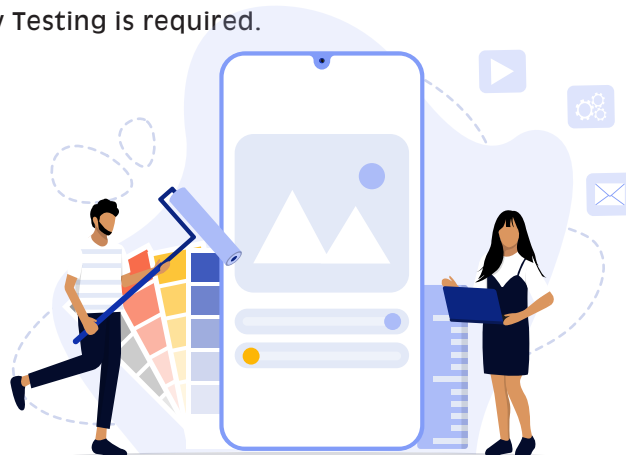
In practical terms, Accessibility Testing needs to verify that the app works well with screen readers, speech recognition software, screen magnification, and other equipment that help in improving areas that matter to those with impaired cognition, vision, hearing, limb activity and other disabilities.

Unfortunately, Accessibility Testing is not given its due importance, resulting in it being ignored in the SDLC. This often stems from the fact that manual Accessibility Testing is difficult to perform, but this does not justify ignoring it, because it means ignoring 15% of the world's population – something that apps cannot afford to do. The answer lies in Automated Accessibility Testing which can bring efficiency and sustainability to this important testing function. This is expanded on in the section – How to Achieve Effective Accessibility Testing.

It is pertinent to mention here, that the World Wide Web Consortium (W3C), recognizing that apps are now an essential part of life, had embarked on its Web Accessibility Initiative (WAI). From this emerged the Web Content Accessibility Guidelines (WCAG) to ensure that disabled users do not encounter obstacles when browsing websites and using mobile apps. These guidelines are part of the legal framework in the US, where Federal Agencies and their contractors, are required to conform to WCAG 2.0. It is therefore important for apps that seek universality, to comply and remain on the right side of the legal framework in countries where WCAG-based guidelines are applicable. With the future possibility of WCAG gaining more worldwide legal acceptance, it is in the interest of every app to work towards being compliant and inclusive.

A mention needs to be made here that the numeronym for accessibility is "A11Y", and it denotes how accessible the software is to all people including those with disabilities.

With this basic understanding of Accessibility Testing, this Whitepaper proceeds to explore the various reasons why Accessibility Testing is required.



WHY IS ACCESSIBILITY TESTING REQUIRED?

The need for Accessibility Testing can be summed up as follows:

1. To promote inclusivity in society by making the app accessible for the differently-abled.
2. To avoid legal battles by being compliant with the law of the land.
3. To enhance app productivity by increasing its reach and usage.

Let's proceed to explore each of these.

01

To promote inclusivity in society by making the app accessible for the differently-abled.

As mentioned earlier, 15% of the world's population suffers from some disability or the other, which means that they cannot use apps unless they are made accessible for their kind of disability. A deeper understanding of these disabilities is the first step towards addressing them. So let's comprehend a little more about the various disabilities and the hurdles faced by each group of differently-abled in engaging with mobile apps.

- **Cognitive Deficiencies:** This group includes people suffering from Attention Deficit Disorder (ADD), Dyslexia, and Alzheimer's ailment. Due to these cognitive deficiencies, these users have a very low attention span, and they also find it difficult to follow too many different screens or themes.
- **Visual Impairment:** This disability includes people who are color blind, in addition to those who are completely blind. For this group of differently-abled, there needs to be contrast and visual alternatives to process content.
- **Auditory Impairment.** This refers to people with partial or complete loss of hearing for whom auditory alternatives need to be built into the app to make it accessible.
- **Physical and Mobility Impairment:** This group of differently-abled, have varying degrees of mobility related disabilities which hamper dexterous hand movements and screen tapping that's required for using apps.

There are various kinds of assistive technologies that apps employ to help overcome these diverse disabilities. Here is where Accessibility Testing fosters the cause of a more inclusive society by verifying that these assistive technologies work well with the app to improve app accessibility, and the functional capabilities of persons with disabilities.

02

To avoid legal battles by being compliant with the law of the land.

Listed below are instances where accessibility standards for mobile apps are legally required:

- The mobile app is linked to a physical store or location
- A customer can only access the business or brand via the web
- The mobile app is used by federal employees
- The app offers advanced communications

However, from a wider perspective, it is prudent to ensure app accessibility even if it is not specifically legally mandated.

In this context, it must be remembered that apps have a global target audience, and even in cases where an app is made largely for one region or country, its users may want to use it in another part of the world. Hence when we look at regulations related to apps, it is necessary to be aware of laws that govern apps across the world, in order to avoid legal hassles. This Whitepaper will briefly touch on some of the more prominent regulations that govern Mobile App Accessibility.

- **ADA or Americans with Disabilities Act**

Though ADA is an American Act, global lawsuits stemming from this Act are alarmingly increasing. Other countries too have similar Acts in place, hence for brevity and convenience ADA will be touched upon as representative of similar Acts. Title III of the ADA which focuses on access for people with disabilities within the realm of public accommodations, has become central to the understanding of web accessibility within the U.S. Two notable court cases related to this issue include Robles vs. Domino's Pizza LLC, and National Association of the Deaf et al. vs. Netflix, Inc. – both of which were ruled in favor of the plaintiffs (i.e. people with disabilities). The rulings detail that companies must provide accessible features in online applications and web-based businesses.

- **Web Content Accessibility Guidelines (WCAG)**

The WCAG guidelines developed by the World Wide Web Consortium is yet another important regulation, as it provides the basis for most website accessibility standards including those mentioned in the ADA. WCAG stresses the following 4 specific principles for website accessibility:

Perceivable: Any information, and components of a mobile app, needs to be presented in the most perceivable way possible.

Operable: Any app interface components, including navigation, needs to be operable, regardless of ability.

Understandable: Any and all information and app functionality must be understandable to all users.

Robust: All mobile app content must be robust enough to be easily interpreted by a range of different user agents, including assistive technologies.

- **The Twenty-First Century Communications and Video Accessibility Act (CVAA),**

CVAA offers telecommunication protection to people with disabilities by mandating that advanced communications must be accessible to all.

- **Section 508 of the Rehabilitation Act**

Section 508 of the Rehabilitation Act requires access to electronic and information technology provided by the Federal Government and applies to all federal agencies when they develop, procure, maintain, or use electronic and information technology. Federal agencies are required to ensure that this technology is accessible to employees and members of the public with disabilities to the extent it does not pose an “undue burden.”

With increase in accessibility awareness the number of demand letters and lawsuits are on the rise. Hence ensuring that mobile apps are accessible by all will go a long way in avoiding costly, time-consuming lawsuits. Failure to comply with regulations could result in fines ranging from USD 75,000 to USD 150,000!

03

To enhance app productivity by increasing its reach and usage.

Wider app accessibility increases the target audience and becomes the channel for increased number of users, and increased app productivity. By ensuring accessibility to people with disabilities, Accessibility Testing widens the app's horizon and adds another 15% of the world's population to the target audience. Furthermore, through Accessibility Testing the app gets customized for the differently-abled, providing them with superior viewing experience, which is one of the essentials for an app's success. All this translates into the ultimate goal of augmented sales and enhanced brand loyalty.

It must be remembered, that an app that poses difficulty in downloading and maneuvering for those with disabilities, will be discarded by them, which translates into rejection by a possible 15% of the world's population, which is no small number. Surely no app can afford to shrink its target audience by a whopping 1 billion!

The forgoing treatise makes it amply clear, that whether the agenda is fostering an inclusive society; meeting legal compliances; or increasing app productivity for boosting sales and brand loyalty – the need for apps to be accessible is indeed compelling, and consequently, Accessibility Testing is something every app must pursue.

HOW TO ACHIEVE EFFECTIVE ACCESSIBILITY TESTING

It is important to make Accessibility Testing a part of the SDLC, so that problems related to accessibility can be detected and sorted out early, thus avoiding unnecessary time and cost build up at later stages. Manual Accessibility Testing is difficult and time consuming and hence automation is the answer for effective and efficient Accessibility Testing.

There are various important considerations that effective Accessibility Testing must pay attention to and these include screen sizes; color contrast; simplified app gestures; adjusted tap target sizes; ease in data entry; and layout consistency.

Guidelines for Mobile App Accessibility Testing

As mentioned earlier, Accessibility Testing needs to ensure that the app functions as it should with screen readers, speech recognition software, screen magnification, and other assistive technologies. There are various components that need to be tested, and these are briefly explained below:

- **Labels** : These are used by assistive technologies, like VoiceOver or TalkBack. Assistive Technology refers to any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons with disabilities.
- **Text Contrast**: Pertains to the ratio between text or images and background color.
- **Hit Area Size**: Area designated for user interaction.
- **View Hierarchy of UI**: Determines ease in navigation of Android apps.
- **Dynamic Font Size**: Option for users to increase font size to suit their needs.

For effective Mobile App Accessibility Testing, it is important to incorporate accessibility testing standards that include Web Content Accessibility Guidelines (WCAG), and also to test on real devices.

Important Criteria/ Methods for Efficient Accessibility Testing

- Ensure testing is done on real mobile devices of different sizes.
- Use tests that incorporate assistive technologies.
- Test on responsive windows on a desktop device.
- Test on a desktop device.

Systematic Approach for Effective Mobile App Accessibility Testing

- Identify the devices to be used for testing.
- Select the site type and variations. In the case of native apps, define app functionality.
- Test for general accessibility concerns, especially those faced by each of the disability groups.
- Test for mobile-specific accessibility problems.
- Test using mobile assistive technology.

Applying the systematic approach to each of the methods mentioned above, will help sort out accessibility issues and make the app more inclusive.

Automated Accessibility Testing – The Efficient Way Forward

We have seen the importance of Accessibility Testing, and yet too often serious thought is not given to it. The difficulties faced in Manual Accessibility Testing add to the tendency to ignore it. However, as seen earlier, an app that wants to make a global mark cannot afford to leave out 15% of the world's population from its purview. The answer to all this lies in opting for Automated Accessibility Testing and making it part of the SDLC, so that accessibility defects can be detected and eliminated early. This is a far more cost and time effective approach than performing Accessibility Testing at the end, which can result in costly rework.

Steps for Automating Mobile App Accessibility Testing

01

Make Accessibility a Core Concern Right from the Design Stage

Accessibility Testing needs to be part of the SDLC right from the word go. When it is thought of at the design stage itself, every function, symbol, indicator and button can be clearly defined to convey uniform nomenclature and meaning for app designers, developers, testers and all stake-holders. Accordingly every material accessibility aspect can be thought of and dealt with, as the app's SDLC progresses. This ensures that the app gets progressively ready for 100% of the population instead of just 85%. To make the SDLC cost-effective, Accessibility Testing should be forethought rather than an afterthought in app development.

02

Use Available Accessibility Testing Tools

For any automation it is important to use the right tools that can bring speed and accuracy to the testing process and this is equally true for Accessibility Testing. For starters, generic accessibility testing libraries which are available for HTML, Android, and iOS platforms can be used. This will help sort out half the accessibility related problems. Another way forward is to use interactive intelligent guided testing, which is implanted in browser extensions. This helps developers test for buttons and links to confirm accuracy and consistency in the accessible names associated with them. These confirmed nomenclatures are shared with the entire team and can be used for creating automated tests.

03

Integrate Regression Testing Methodology into Accessibility Testing

Regression Testing tremendously cuts down on testing time, efforts and long term costs, by ensuring that new or modified codes do not adversely affect previously approved codes or programs. Hence using automated Regression Testing for Accessibility Testing is a great way to ensure cost-effective accessibility.

04

Select the Right Test Automation Platform

To get the most out of automated testing, it is important to select the test automation platform that best suits the app. Care should be taken to ensure that the platform incorporates time tested Accessibility Testing tools and truly takes care of all aspects of accessibility. Also ensure that the platform keeps in touch with the latest in technology, which is ever-improving. The platform's reporting systems also need to be checked to ensure that the reports clearly pinpoint the accessibility issues and make it easy for developers to rectify and testers to certify the app.





CONCLUSION

Mobile apps are today almost on par with essential services, and fall into the domain of public accommodations. However a substantial 15% of the world's population suffers from disabilities that may preclude them from accessing apps, even though apps are almost indispensable for daily living. It is therefore crucial for every app that aspires to be universal, to ensure that it caters to the 1 billion people who live with cognitive, visual, auditory, or mobility impairments.

There are various regulations that seek to protect the rights of the differently-abled, to promote an inclusive society. These result in financial risks for non-compliant apps in terms of legal suits and fines, more so with users being more informed of their rights and legal activists training their guns on web and mobile apps that don't meet regulations like ADA and WCAG. Accessibility Testing increases universality of apps thus reducing legal risks. Apart from this, Accessibility Testing by bringing wider reach makes the app more productive. Therefore, it is important to incorporate Accessibility Testing right from the app's design stage and all through the SDLC.

Manual Accessibility Testing has many limitations, besides being time-consuming, and hence it's important to automate this crucial aspect of testing.

For Mobile App Testing, BOTm is a good recommendation, as it is a centralized option for cost-effective, efficient Accessibility Testing, and furthermore caters to the entire spectrum of Mobile App Testing – while unstintingly incorporating the latest in technology. Visit www.botmtesting.com and sign up for a Free Trial.

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developed for both Android and iOS devices.