RISKS OF NONCOMPLIANCE WITH ADA FOR MOBILE DEVELOPMENT

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Abstract. This article analyzes the risks faced by mobile app development companies due to non-compliance with accessibility standards for people with disabilities. The study aims to examine the impact of not adhering to accessibility standards on business in terms of reputation risks, legal consequences, and loss of revenue. General scientific methods of cognition, such as analysis, synthesis, induction, deduction, and comparison, were used in the research. The study results indicate that non-compliance with accessibility standards for mobile apps can lead to significant risks for companies. Firstly, the inaccessibility of apps can severely impact brand reputation. Research from Stanford University shows that 71% of people with disabilities leave a website if it is inaccessible. This applies not only to websites but also to mobile apps, where the lack of accessibility is perceived as neglecting the needs of a significant portion of potential users, leading to a loss of trust and product abandonment. This can significantly damage a company's reputation and result in customer loss. Legal risks associated with non-compliance with accessibility standards were also examined. The number of lawsuits related to technology inaccessibility is increasing every year, reaching 2,088 in 2019, a 20% increase compared to the previous year. This highlights serious financial risks and legal obligations for companies that do not consider accessibility requirements in their mobile apps. Additionally, loss of revenue is another significant risk. According to the ClickAway Pound Report, 75% of customers with disabilities abandon business services due to a lack of understanding of their needs or poor customer service. Inaccessible mobile apps can result in losing a substantial portion of revenue as potential customers switch to more accessible alternatives. From the perspective of innovation opportunities, companies that do not focus on accessibility may lose the chance to be industry leaders. Accessibility drives innovation by requiring developers to think creatively to address unique challenges and needs of users with disabilities. Ensuring accessibility also expands market opportunities by attracting more customers, including those with disabilities, which can significantly improve user experience and overall customer satisfaction, increasing loyalty and repeat visits. The practical significance of the study lies in identifying strategic directions for mobile app developers to avoid potential risks and ensure accessibility for all users.

Keywords: accessibility, ADA, mobile apps, inclusivity, risks, standards.

Introduction

Accessibility apps are designed to enhance the usability of devices and technologies for people with disabilities. These apps aim to bridge the gap between technology capabilities and the diverse needs of users with physical, visual, cognitive, hearing, or neurological impairments. Consequently, accessibility apps play a crucial role in promoting independence, inclusion, and improving the quality of life for people with disabilities [10].

The goal of accessibility apps goes beyond mere convenience; they represent technological progress aimed at ensuring everyone, regardless of their abilities, can access, perceive, and interact with digital products and services. This commitment to accessibility is evident in a wide range of available solutions. Continuous innovation and community involvement further aim to transform the digital landscape into a more inclusive space.

The evolution of accessibility apps in technology has been significant. From the early days of typewriters designed to assist the blind in the 1800s to modern

sophisticated apps enabling control of household tasks through voice recognition, the journey has been transformative [10].

Mobile apps supporting accessibility play an essential role in ensuring independence and convenience for people with disabilities. In recent years, significant progress in technological inclusivity has been achieved through the active efforts of leading companies in the United States, developing apps for people with disabilities. For example, Uber has focused on developing its ride-sharing app by integrating features such as VoiceOver support, high-contrast colors, and the ability to easily book rides for passengers with service animals, crucial for visually impaired or other physically limited individuals [5]. Similarly, Bank of America has enhanced the accessibility of its mobile banking app by implementing features like adjustable text size, voice navigation, and screen reader compatibility, which are critical for ensuring financial independence and managing personal finances [5].

BBC News effectively adapted its news app by providing font size adjustment and high-contrast mode options. This allows visually impaired people to consume information more easily, ensuring their right to access current news [5].

Gradually, accessibility technologies are being adopted by thousands of other companies worldwide. By 2030, the value of this segment is expected to reach $40 billion, indicating the significant commercial and social importance of inclusive technological solutions. These innovations aim to improve the quality of life and increase the independence of people with disabilities, who constitute approximately 16% of the world's population. Control over $13 trillion in disposable income underscores the significant economic impact of this group on the market, compelling businesses to invest in developing products and services that meet their needs [9].

These examples highlight the strategic necessity of integrating accessibility into product strategies, enabling not only the opening of new markets but also reducing brand risks associated with neglecting the needs of people with disabilities.

Literature review

The issue of mobile app accessibility for users with disabilities is well-researched in both domestic and international scientific literature. Significant contributions to this topic have been made by authors such as P. Acosta-Vargas et al., who conducted a scoping review of mobile app accessibility for users with disabilities, identifying key issues and proposing solutions [1]. Additionally, J. Dekelver et al. have made significant contributions by researching the design of mobile apps for people with intellectual disabilities, which is a crucial aspect of ensuring technology accessibility [4].

Current aspects of the problem are also highlighted in online publications. For example, an article by ADA National Network details what the Americans with Disabilities Act (ADA) is and how it affects mobile app development [2]. D. Gibson provides a detailed guide on ADA and WCAG compliance standards for mobile apps, emphasizing the importance of these standards for ensuring accessibility [5].

Other important sources include an article by Anuorayaas, which examines the main features that apps should have to ensure accessibility for people with disabilities [3]. T. Kräuter and S. Friedrich emphasize that mobile accessibility can significantly impact business success and call for immediate action in this area [6].

Works that explore the risks associated with the inaccessibility of websites and mobile apps also deserve attention, such as a publication on Lexology [7]. Moldwood explores the role of accessibility features in app design, and Perkins highlights technologies for people with disabilities that make the world more accessible [8].

Despite a sufficient amount of literature on this topic, there is a lack of systematic material. Therefore, using various scientific methods of cognition, the information was analyzed, grouped, and systematized, and presented in the light of the research topic.

Purpose of the article

The aim of the article is to examine the risks faced by mobile app development companies from non-compliance with accessibility standards for people with disabilities.

Research results

Features of applications accessible to people with disabilities

Accessibility apps have evolved to meet the diverse needs of users with impairments, from blindness to cognitive limitations. Developers use the latest technologies to create innovative solutions that enhance the independence and quality of life for these individuals.

Apps for the visually impaired. Applications for the blind and visually impaired, such as Be My Eyes and Envision AI, significantly enhance accessibility and independence. Be My Eyes connects users with volunteers for assistance with reading labels or navigation, while Envision AI uses AI to describe objects and environments, promoting greater autonomy [10]. Most visually impaired individuals rely on screen readers to interact with devices. These screen readers convert on-screen information into speech or Braille on a Braille display. Both Android and iOS now offer screen readers with gesture-based functions, making it easier for visually impaired users to hear descriptions of features on their devices and manage them using touchscreens [3].

– Hearing impairments. Apps have been developed to provide access to subtitles in public places, promoting cultural inclusion [10].

– Speech impairments. Alternative and augmentative communication tools, such as iVocalize and Jabberwocky Hands-Free AAC, are crucial for individuals with speech impairments. These apps allow users to communicate through voice or gestures, reducing communication barriers. Apps for smart home and health management offer more control and independence by using voice commands and simple interfaces for managing home devices [10].

– Enhancing user experience with accessibility apps. Creating an accessible app involves optimizing the interface to meet various needs, such as using voice commands for people who cannot use touchscreens. Platforms like Android and iOS offer built-in accessibility features, such as Assistive Touch and Magnifier, making technology more accessible [10].

– Mobility impairments. Many devices provide hands-free control options. Advanced speech recognition features are beneficial for individuals with hand and upper limb movement impairments. Additionally, stylus use for screen control is also possible [3].

– Innovations in accessibility apps. Innovative apps like Color ID and Envision

AI enhance the capabilities of visually impaired individuals through real-time color and text recognition. Navigation apps like NotNav and NowNav use audio instructions and artificial intelligence to improve mobility and independence [10].

– Accessibility in everyday life. Accessibility apps for travel and health management, such as WheelMate and Passenger Assistance, help users find accessible places and communicate their needs. Communication and social inclusion apps like Sociability and MiFinder reduce social isolation by connecting communities [10].

– Privacy and data security in accessibility apps. Ensuring data security in accessibility apps is crucial due to the handling of sensitive information. Developers must implement security measures, such as encryption and secure data storage, to protect user information [10].

Alongside specialized mobile apps that support the physiological capabilities of individuals with disabilities, other everyday apps should also include options for use by people with disabilities. An app is considered accessible if it meets specific specialized standards and can be used by all people with disabilities. This includes access for individuals with mobility impairments, visual impairments, low vision, hearing impairments, or intellectual disabilities [3]. Accessibility features simplify access to assistive software and devices, such as:

- o screen readers;
- o text-to-speech software;
- o alternative input devices;
- o screen magnifiers;
- o speech recognition software;
- o refreshable Braille displays;
- o braille printers.

Understanding the challenges faced by people with disabilities and how to improve accessibility for them [3].

Regulatory framework for the development of mobile applications for people with disabilities

Developing mobile applications that ensure high levels of accessibility and inclusivity for individuals with disabilities requires careful consideration of various legislative requirements. Laws such as the Americans with Disabilities Act (ADA) and the Accessible Canada Act (ACA) form the foundation that defines the obligations of developers and their products.

Americans with Disabilities Act (ADA). Enacted in 1990, the ADA is a fundamental law that prohibits discrimination based on disability in areas such as employment, education, transportation, and public and private places accessible to the general public. The law covers five sections, each focusing on a specific aspect of life and ensuring equal opportunities for people with disabilities [2].

Accessible Canada Act (ACA). The ACA, enacted in Canada, aims to eliminate and prevent barriers in various areas, such as federal transportation, federal administration, and communications. The law requires organizations to create accessibility plans that detail measures to eliminate and prevent barriers and report on the achievement of these goals.

Web Content Accessibility Guidelines (WCAG). WCAG 2.2, current as of

November 2023, sets standards for mobile web content, mobile web applications, native and hybrid applications to ensure their accessibility. The standards include specific requirements for mobile accessibility, such as touch target size, device orientation, and navigation sequence [5].

Conducting an accessibility audit of mobile applications is critical for compliance with legal requirements and WCAG guidelines. The audit helps identify deficiencies and plan improvements to achieve greater inclusivity and accessibility [5].

Legislative requirements, such as the ADA and ACA, along with international WCAG guidelines, form a comprehensive approach to mobile app development, ensuring their accessibility for individuals with disabilities. These regulatory frameworks obligate developers to ensure their products are inclusive and accessible to all users.

Given these legislative frameworks, the importance of strategic planning in the development of accessible mobile applications becomes evident. This planning should include not only compliance with existing requirements but also anticipation of future changes in legislation and technology.

Table 1 – Standards for compliance in the development of mobile applications for people with and without disabilities

Category	Recommendations	Examples
Legislative requirements	Study and comply with relevant laws such as ADA and ACA.	Americans with Disabilities Act (ADA); Accessible Canada Act (ACA)
Accessibility standards	Apply international standards, like WCAG, to the development of all mobile products.	Web Content Accessibility Guidelines (WCAG)
Universal design	Integrate principles of universal design to create inclusive and accessible products.	Designing interfaces accessible to people with various types of disabilities
Accessibility audit	Conduct regular accessibility audits to identify shortcomings and plan improvements.	Checking mobile apps for WCAG compliance
Strategic planning	Develop a strategic plan that considers current requirements and anticipates future changes in legislation and technology.	Plan for adapting to new technological capabilities and changes in legislation
Technological innovations	Implement the latest technologies that improve the inclusiveness of mobile apps, including AI and machine learning.	Develop apps with speech and image recognition features to enhance accessibility for the visually impaired.

Brand risks in developing mobile applications for people with disabilities

As technology advances, mobile app accessibility becomes a crucial requirement in an inclusive world. Statistics indicate significant challenges in this area. According to Stanford University research, 57% of users do not recommend a business with a poorly designed website. Simultaneously, 71% of people with disabilities leave a website if it is inaccessible. These factors affect 61 million adults in the US with disabilities, impacting their daily activities [8].

Developing mobile applications that do not consider the needs of people with disabilities poses significant risks for businesses. These risks range from negative impacts on brand reputation to serious legal consequences. Inclusivity and accessibility are becoming increasingly important as the global community strives to ensure equal opportunities for all. Below are the main risks companies may face when ignoring these critical aspects in their mobile developments.

Loss of reputation and customers. The inaccessibility of mobile apps can lead to a loss of consumer trust, especially among those who rely on special adaptive technologies. Neglecting accessibility can be perceived as ignoring the needs of a significant portion of potential users, thereby diminishing the brand's reputation.

Legal costs. Another significant risk involves legal consequences. For instance, in 2019, the number of lawsuits related to the inaccessibility of websites and other technologies increased by 20% compared to the previous year, reaching 2,088 [7]. This underscores the potential financial risks and obligations for companies that do not pay attention to accessibility standards.

Revenue losses. According to the ClickAway Pound Report, 75% of shoppers with disabilities abandon business services due to a lack of understanding of their needs or poor customer service [7]. Inaccessible mobile apps can result in losing a substantial portion of revenue as potential customers switch to more accessible alternatives.

Limitation of innovative opportunities. Companies that ignore accessibility in their mobile apps may miss out on the chance to be innovative in their field. Accessibility often drives innovation as it requires app developers to think creatively to address unique challenges and needs [10].

Expansion of market opportunities. Ensuring accessibility not only meets legal norms but also expands market opportunities by attracting more customers, including those with disabilities. This can significantly improve user experience and overall customer satisfaction, increasing loyalty and repeat visits [10].

To ensure sustainable development and a positive brand image, it is important not only to comply with existing accessibility standards but also to actively implement these standards in mobile app development. This will not only avoid potential legal risks and financial losses but also significantly expand market opportunities by attracting a larger audience and enhancing customer satisfaction. Inclusivity in technology is not only a moral obligation of modern companies but also a strategic step in establishing leadership in the market.

Conclusions

The research highlights the importance of adapting mobile applications to meet the needs of people with disabilities, particularly through the use of innovative technologies and universal design. These approaches enhance user independence and quality of life by providing tools for greater autonomy, such as household and personal health management tools, as well as navigation and communication applications.

Legislative frameworks such as the Americans with Disabilities Act (ADA) and the Accessible Canada Act (ACA) set standards for the development and adaptation of mobile applications, ensuring their accessibility and inclusivity. The Web Content Accessibility Guidelines (WCAG) provide detailed technical requirements that promote the creation of a barrier-free digital environment.

Ignoring the needs of people with disabilities in mobile app development can lead to significant risks, including legal consequences, loss of reputation, and financial losses due to forgone revenue. Addressing these aspects is critically important for ensuring inclusivity and accessibility, which not only meets legislative norms but also expands market opportunities.

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