Accessibility

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What is Accessibility

OVERVIEW

ACCESSIBILITY CONSTRAINTS

What are Constraints?
Constraints come in many shapes and sizes, they are found in our everyday life. In fact, the creation of a child even poses constraints. In the form of design and development constraints can be things like time, budget, skills, content, client views and more. Constraints can even be what device you are designing for, the physical limitations of the device such as screen size, battery life and more.

Accessibility Constraints
Constraints in the form of accessibility are constraints that limit user's ability to use or otherwise access your website or mobile application. Therefore, if an application or website doesn't design and implement the proper functions or designs to cater to this large group of users they will be hindering the success of their app/website. In fact, in 2014 the Department of Justice announced plans to update the Americans with Disabilities Act to include requirements for mobile application developers to comply with accessibility regulations and provide an accessible user experience. Items such as text, navigation, buttons, media and images must be accessible to everyone in an easy and helpful manner. Additionally, all content elements need to give accurate and resourceful information, including labels for form fields, images and text transcript for videos. Some common disabilities that designers and developers need to plan for are users with color blindness, visual and hearing impairments, and other physical or age-related limitations. All of these things needs to be taken into consideration, especially when testing your application or website.

Different Types of Constraints

CONSTRAINTS

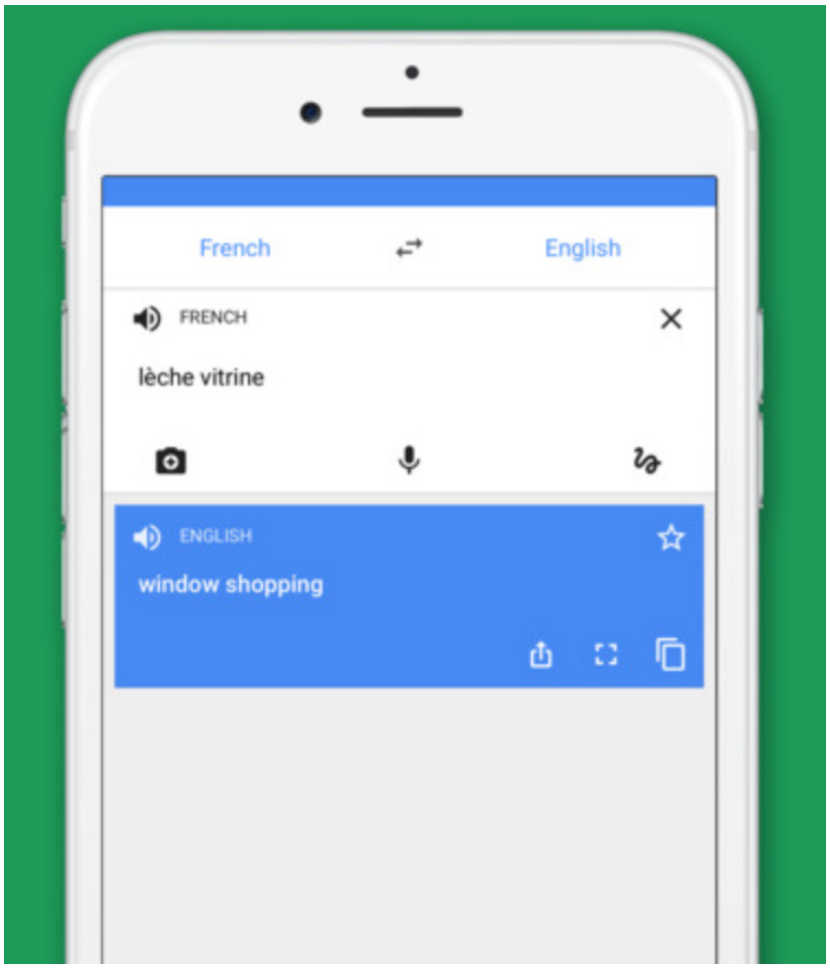
AUDITORY IMPAIRMENTS

Having auditory impairments may not pose a problem at first for mobile application users but there are certainly some accessibility issues that need to be looked at. A frustration that a user with auditory impairments will face is the fact that a large portion of notification alerts are auditory. When someone calls you your phone rings, when someone texts you or there is an app notification there is an auditory beep, etc. However, a lot of apps today are implementing additional notification settings to account for this. One thing that is still unheard of is sign language translation and other similar features in regards to sign language.

AUDITORY IMPAIRMENTS CONT.

ONE APP THAT DOES NOT CONFORM OR PARTIALLY CONFORMS TO THE ACCESSIBILITY CONSTRAINT

Google Translate is a great application for translating on the fly, not only can you translate text without internet connection but you can use your smartphone to translate images in real time. However, one feature lacking here is sign-language translation. You are able to speak into the app for translations but support is lacking if not non-existent for sign language.



https://itunes.apple.com/us/app/google-translate/id414706506?mt=8

AUDITORY IMPAIRMENTS CONT.

DESCRIBE CONSIDERATIONS THAT CAN BE TAKEN TO MAKE THE APPLICATION MORE ACCESSIBLE TO ALL USERS

The first considerations any app developer can take to improve the accessibility for auditory impaired users is in the form of notifications. Since any audible sounds won't matter to auditory impaired users taking additional steps beyond the basic Apple visual notifications can go a long way. Additional visual notifications could be a camera flash, screen flash, repeated notification alert and more. On the other hand, visually impaired users will need to rely more on the auditory alerts which is why both audible and visual alert signals are required. The ability for items to be read aloud on the screen and menu navigation through speech and keyboards can also improve impaired users experience.

To improve upon what Google Translate has already done and make it more accessible for auditory impaired users a number of considerations can be made. Currently, Google Translate helps deaf and non-deaf individuals communicate via English to English translations. A user can speak into the app in English then what they spoke is displayed on the screen in bold text in English that the deaf individual can easily read (Jaxon, 2013). This isn't really a feature per say but it is useful nonetheless. Some actual features that Google can consider to help auditory impaired users are sign language to English and vice-versa translations with the ability to record a sign language and have that translated to English.

AUDITORY IMPAIRMENTS CONT.

DISCUSS THE TACTICS AND TOOLS THAT CAN BE IMPLEMENTED TO ADDRESS THE ISSUE AND MAKE THE APPLICATION MORE ACCESSIBLE TO THE USER.

The ability to translate sign language to English is still an ongoing developmental process. Currently there is no mainstream application that can accomplish this. However, a team of researchers at Texas A&M University have developed wearable technology that will aid in ASL and non-ASL conversations (Bussing, 2015). The device still has a lot of limitations but it is a stepping stone in achieving sign language translation.

Based on the growth spurt wearable technology has seen in recent years I can definably the ability for products such as the Apple Watch to utilize the many sensors and gyroscopes it has to following the motion of your hand/wrist for sign language translation. The software may not be immediately available today but the technology is certain here. If facial recognition software is successful, then there is no reason similar technology cannot be used for sign language translation.

AUDITORY IMPAIRMENTS CONT.

SUMMARIZE THE STEPS YOU WOULD TAKE TO SOLVE THE APP LIMITATION AND WHAT THIS WILL DO FOR THE USER

The first step I would take in improving Google Translate for auditory impaired users would be to make the English to English translations more of a feature for deaf users. Currently, it is used to display spoken text in bold on the screen which a deaf individual can then read. To build upon this useful feature for auditory impaired individuals I would make the translations in real time (currently offered but it is not very fluid) so English speaking users can talk while the app displays what they are saying on the screen. This will make it possible for people that do not know sign language to easily communicate with deaf individuals.

Another feature I would implement into Google Translate would be the for sign language video recognition, similar to that of facial recognition. This is not something that would be a straight forward implementation but it is certainly possible and would greatly improve Google Translates functionality for auditory impaired individuals. The ability to translate other languages into sign language would also be an amazing feature for this group of users. Short videos or even images/icons representing the sign language sign could be used in this feature.

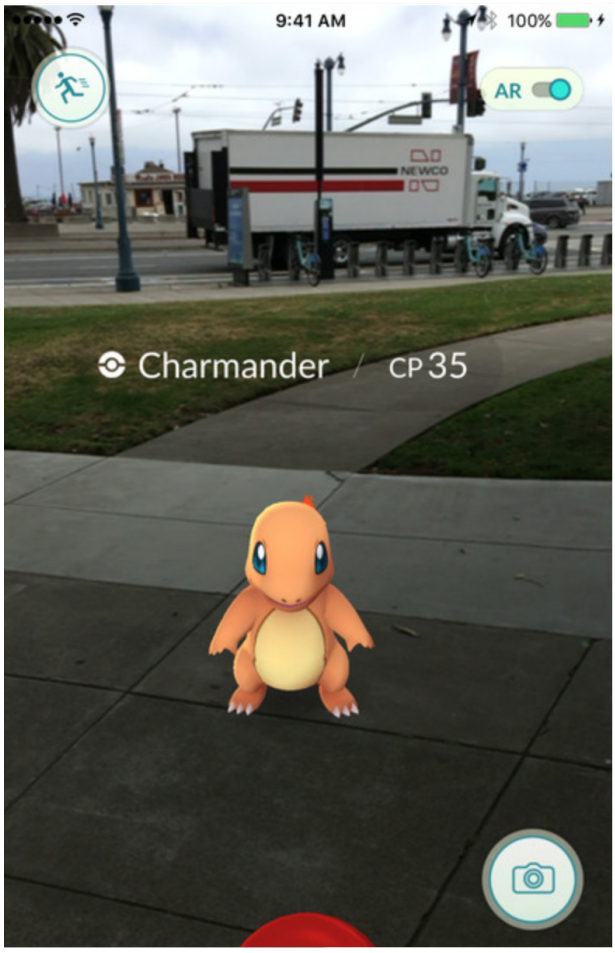
VISUAL IMPAIRMENTS

Users with visual impairment face a lot of challenges when trying to user a mobile application and their user experience can suffer greatly from this if the application's developer didn't take strives to improve the experience for this group of users. Things such as simple menu's and just navigating an app can become a problem for visually impaired users if proper VoiceOver is not used and integrated within the application. Other frustrations can come from color blind users in applications that rely heavily on red's and green's for notifications or other visual elements.

VISUAL IMPAIRMENTS CONT.

ONE APP THAT DOES NOT CONFORM OR PARTIALLY CONFORMS TO THE ACCESSIBILITY CONSTRAINT

Pokemon Go is an app that poses some problems to visually impaired users because the main mechanics of the app and user interactions are mainly visual. One part lacking in this aspect is when catching a Pokemon by throwing a Poke Ball since this action is entirely visual by flinging a Pokeball at a Pokemon. Users that are visually impaired will have a hard time properly aiming the Pokeball in the proper direction.



https://itunes.apple.com/us/app/pokemon-go/id1094591345?mt=8

VISUAL IMPAIRMENTS CONT.

DESCRIBE CONSIDERATIONS THAT CAN BE TAKEN TO MAKE THE APPLICATION MORE ACCESSIBLE TO ALL USERS

To improve the accessibility for Pokemon Go user's Niantic and the developers can do a number of things. In the case of catching Pokemon, audio aids and cues could be used to help visually impaired users when catching a Pokemon. These cues can help guide the user in the direction to throw the Pokeball (AFB, 2016).

Additionally, visually impaired Pokemon Go users will have a hard time reading and accessing the menu's in Pokemon Go such as the Pokedex. In order to make these items more accessible items such as an in-game speech engine could be used as well as VoiceOver features (AFB, 2016). The aforementioned menu problem is not unique to Pokemon Go as pretty much any application that has menu's would need a similar feature for visually impaired users to easily navigate.

VISUAL IMPAIRMENTS CONT.

DISCUSS THE TACTICS AND TOOLS THAT CAN BE IMPLEMENTED TO ADDRESS THE ISSUE AND MAKE THE APPLICATION MORE ACCESSIBLE TO THE USER

The menu problem for visually impaired users can be fixed with an Apple-style VoiceOver system that reads the menu to the user. In fact, Apple's VoiceOver system can be implemented by iOS application developers without the need to create their own system (Apple, 2016). The integration is not automatic though and requires some work by the developers to ensure proper functionality but the system is readily available to be integrated with. If the developers of Pokemon Go were able to integrate the app, specifically things like the Pokedex, with Apple's VoiceOver, they could create a much more fluid experience for their visually impaired users.

To address the Pokemon Go-specific problem of throwing Pokeballs to catch Pokemon the developers would need to develop their own solution as this is a specific problem to their app. According to an article from the American Foundation for The Blind, Niantic says they are working on an upcoming Pokemon Go Plus accessory that can notify users of Pokemon in the area and even catch the Pokemon for them (AFB, 2016). Simple audio cues to guide the user in throwing Pokeballs would go a long way for visually impaired users. Even just having an auditory alert to let the user know a Pokemon has appeared, then a button to simple catch the Pokemon could greatly improve the experience for them.

VISUAL IMPAIRMENTS CONT.

SUMMARIZE THE STEPS YOU WOULD TAKE TO SOLVE THE APP LIMITATION AND WHAT THIS WILL DO FOR THE USER

To solve Pokemon Go's limitations for visually impaired users I would do a few things. First of which would be to properly integrate Apple's VoiceOver system with the application. This would be used for the menu's and Pokedex and even the visual map. Since the visual map is heavily relied on in Pokemon Go to show nearby Pokemon, PokeStops and more, having the items located nearby on the map simply read aloud would be a great improvement.

The next improvements I would make to the app would involve making it easier for visually impaired users to catch Pokemon, now that they have been successfully alerted that a Pokemon has appeared via the above methods. In my opinion, there are a few ways to implement improvements. The first of which would be simply allowing the user to click a button, or anywhere on the screen to catch a Pokemon once they have encountered one. However, this would take away the Pokeball throwing aspect of the game. To maintain that feature while also assisting visually impaired user's audio cues could be used to help guide the user when throwing the Pokeball. Cues such as "throw more to the right" or "throw more to the left" so they can still feel like they are actually "catching" the Pokemon.

SPEECH IMPAIRMENTS

Just like auditory impairments, speech impairments don't immediately pose a problem for users. Speech impaired users can still read what is on the screen and use a majority of the functions present in mobile applications. However, a frustration that speech impaired users can encounter is when there is a need to speak in the mobile apps or otherwise communicate verbally.

ONE APP THAT DOES NOT CONFORM OR PARTIALLY CONFORMS TO THE ACCESSIBILITY CONSTRAINT

Texting applications, such as WhatsApp, can present unique problems for speech impaired users. Users with this type of impairment may require the use of sign language or picture keyboards and WhatsApp currently does not offer that. Additionally, Video Calls are not supported on WhatsApp which would make it impossible for speech impaired users to use the calling feature of the application.

https://itunes.apple.com/us/app/whatsapp-messenger/id310633997?mt=8

SPEECH IMPAIRMENTS CONT.

DESCRIBE CONSIDERATIONS THAT CAN BE TAKEN TO MAKE THE APPLICATION MORE ACCESSIBLE TO ALL USERS

As it stands right now WhatsApp does not even have an accessibility options panel. The lack of documentation for accessibility from such a large app is rather appalling. Features like Voice Messaging and calling are completely useless for speech impaired users. There is not a lot of consideration for impaired users with WhatsApp and it leaves something to be desired from this group of users.

The biggest consideration, and the easiest, that WhatsApp can do is to write some proper accessibility documentation for the app. A quick Google search for WhatsApp accessibility shows a lot of complaints from visual, auditory and speech impaired users who are having trouble with the app. Another big consideration WhatsApp can make is to integrate with third-party keyboard applications for sign language. This well certainly make the app more available to user suffering from the standard keyboards available.

SPEECH IMPAIRMENTS CONT.

DISCUSS THE TACTICS AND TOOLS THAT CAN BE IMPLEMENTED TO ADDRESS THE ISSUE AND MAKE THE APPLICATION MORE ACCESSIBLE TO THE USER

The first feature that can be implemented is Video Calling. This would allow for speech impaired users to communicate using sign language, like they would when using Face Time. Not only would this benefit speech impaired users but it is a feature other WhatsApp users have been asking for for awhile. The use of third-party keyboards can be used to solve the the typing problems faced by speech impaired users. However, instead of having to look for a third-party solution a better and more fluid action would be for WhatsApp themselves to develop a solution.

Something that WhatsApp can do to really appeal to speech impaired users would be to allow users to record a message in sign language and then either send that video as is, or translate it into text. Many applications can translate text into sign language but there are very few, if not any, that currently offer this feature. Should WhatsApp pursue that feature and integrate it with their app they would really expand their outreach.

SPEECH IMPAIRMENTS CONT.

SUMMARIZE THE STEPS YOU WOULD TAKE TO SOLVE THE APP LIMITATION AND WHAT THIS WILL DO FOR THE USER

The first step I would take in improving the accessibility of WhatsApp is to properly document the accessibility features already available and house all of them in a settings page. Currently users have to navigate to WhatsApp's website for FAQ's that can answer a very few questions regarding accessibility (such as how to change the font size for messages). Having to leave the app for that in and of it self is inaccessible.

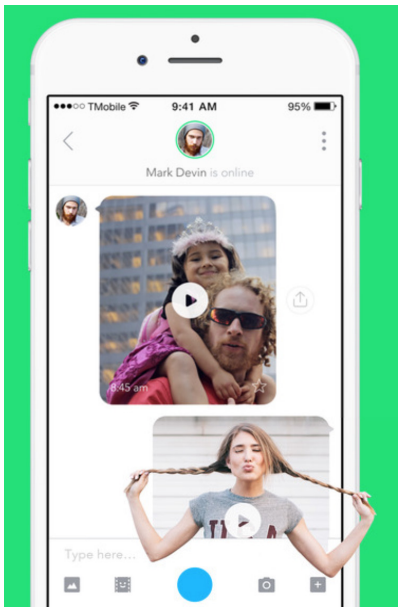
To really improve the user experience for WhatsApp I would add Video Calling and the ability to send short video clips in addition to being able to send audio recordings. Being able to send audio clips is great but pretty useless for speech impaired users. However, adding the ability to send video clips would allow speech impaired users to record short sign language clips and easily send them.

GLIDE APP

ONE APP THAT CONFORMS

One frustration that I mentioned above with WhatsApp is already being utilized in a different app. That frustration is not being able to communicate in sign language via the ability to send short video clips. The app in question that is based around the idea of being able to communicate with short video messages is called "Glide". Glide was founded in 2013 and the founders envisioned it as "WhatsApp but for video messages" (Horwitz, 2015). However, the app has become very largely used by people that have hearing and speech impairment. The team discovered that their app was popular among deaf individuals when the most requested feature for the app was subtitles on their marketing videos. A very strange request that boils down to something very simple; deaf individuals wanted to share the video with other deaf individuals but the marketing videos and promotional material relied on spoken word (Horwitz, 2015).

Because WhatsApp and other messaging applications aren't accessible, hearing and speech impaired users turned to Glide because they couldn't properly express themselves with the preexisting apps. Since these users express themselves through sign language, which can only currently be portrayed through video, Glide was able to capture that market. The apps developers are also currently looking at ways to create instant subtitles for sign language as well as converting text into visual graphics (Horwitz, 2015).



https://itunes.apple.com/us/app/glide-live-video-messenger/id588199307?mt=8

ONE APP THAT CONFORMS TO GOVT. REQUIREMENTS

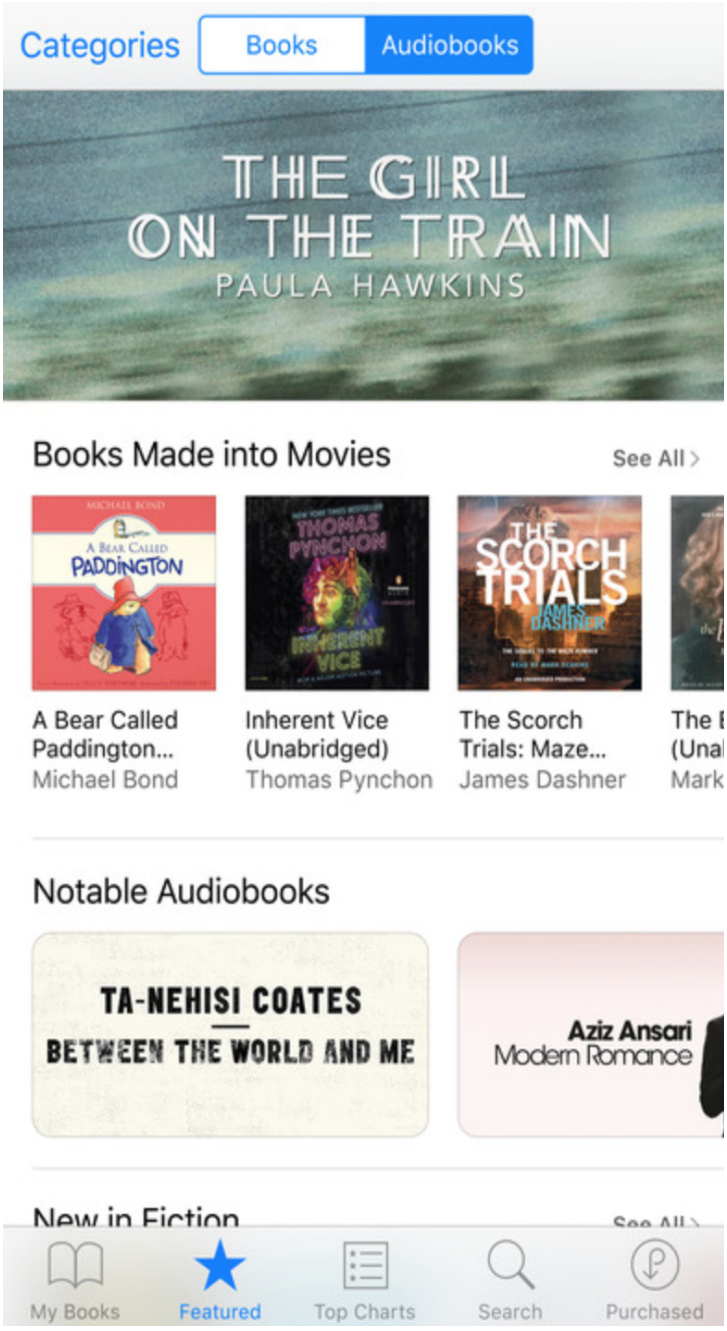
For a mobile application to be compliant with the government requirements your app should be able to answer "yes" to the following questions (US Dept. of Veteran Affairs, 2016).

• Did we write the application in a fashion that conforms to the coding requirements in the relevant standards? Did we code it right? (Technical Requirements)
• Can people with disabilities using the application complete the core tasks of the application? Does the application as a whole produce an accessible experience? Can people with disabilities use it? (Functional Requirements)
• Is the deployment context of the application accessible? Does the information, documentation, support and training produce an accessible experience? (Support Requirements)

On the surface these are what developers need to ask themselves, if you dive deeper into those requirements you will find things such as "ensure menus can be opened from the keyboard" (US Dept. of Veteran Affairs, 2016).

One application that meets the above guidelines and conforms to Section 225 and 508 is Apple's iBooks. For starters, the application offers audiobooks for the visual impaired. Even if the book you have downloaded is not strictly an audio book you can enable VoiceOver and have Siri read the book to you (Gil, 2013). When reading books the font can be increased and the color can be changed for readers with auditory impairments that can't utilize audio books or VoiceOver. iBook authors can ensure they're books are accessible by adding labels and descriptions for images allowing visually impaired users to utilize VoiceOver (Apple, 2016).

ONE APP THAT CONFORMS TO GOVT. REQUIREMENTS



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ACCESSIBILITY Q&A

DO YOU, A FAMILY MEMBER OR A FRIEND HAVE ANY OF THE LIMITATIONS LISTED ABOVE, THAT NEED TO BE ADDRESSED IN A MOBILE APP? IF THE ANSWER IS NO, IMAGINE YOURSELF IN 50 YEARS.

I personally do not have any of the limitations listed above, however, my mother has a hard time reading some of the smaller text on her iPhone. I wouldn't really call it a limitation so to speak as she just sets the font size bigger in the iPhone's accessibility options. In 50 years I imagine I will have the same problem, but it's really hard to say because in 50 years' time technology is going to have advanced more than we could ever imagine. By that time some of the accessibility problems we face today may not even exist in future technology.

PRIOR TO LEARNING ABOUT ACCESSIBILITY CONSTRAINTS, HOW DID YOU LOOK AT ADDRESSING THESE ITEMS?

Before learning about accessibility when I would think about creating mobile apps it never even came into my head. You always want to appeal to the mass market and you always forget that there are people out there with limitations that will have trouble using the app, and therefore you need to take that into consideration when designing/developing. Now that I understand more about accessibility it has certainly made me think about creating applications differently, or at the minimum putting effort into making sure they are accessible for almost everyone (after all it is impossible to make an application accessible to the 100 percent).

OTHER

ACCESSIBILITY Q&A CONT.

IN FUTURE APPS THAT YOU ARE WILL DEVELOP, HOW WOULD YOU ADDRESS THE APP LIMITATIONS TO ALLOW ACCESS TO ALL? WOULD YOU ADDRESS THESE ITEMS IN ALL APPS YOU CREATE, SOME OF THE APPS YOU CREATE, OR WOULD YOU STILL NOT ADDRESS THESE ITEMS AND WHY?

When creating future applications, I will absolutely not entirely forget about the accessibility side of the application. However, that is not to say I will focus a majority of my time making it as accessible as possible. I will strive to utilize as much of Apple's built-in accessibility features as I can, but I don't think I would explicitly go out of my way to create a whole new accessibility function unless completely necessary. In my opinion there needs to be a balance between good design, good functionality and good accessibility. You can't have just one or the other, a great app has to have all three, even if people without limitations don't realize or appreciate the accessibility side, someone will.

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