NextVision - Paduraru Andra Elena

Research:

What did others?

Searching on the web I saw that many of the apps for visually impaired people rely mostly on touch gestures or basic voice commands. On Android there is a preinstalled accessibility, named TalkBack and a lot of helpful apps that can be installed from the app store. Unfortunately, there are plenty of normal apps that do not support TalkBack features and can't be used by this category of people. Compared to iOS, Android apps that should support this are harder to code and require more time and complexity, which is the reason why iOS has more complex features. This is also the reason why on Android there is still a high demand for apps that can manage multiple commands and more complex tasks.

Methods and techniques:

Usually this kind of apps have a few methods in order to help people in need that: listen to the person and process the speech in order to do specific tasks, be able to determine what is in a specific image(using camera or gallery), touch gestures in order to do tasks, magnifying text, read text from images, managing notifications in order to always appear on screen etc.

Almost all apps have back-end and front-end techniques implemented, like React, Ionic, Xamarin, each one allowing the developers to code their app in different languages like Java, C# or C/C++ with the help of HTML, CSS and Javascript.

Android preinstalled features:
https://support.google.com/accessibility/android/answer/6006564?hl=en

Evaluation methods and results:

Most of the time before creating an app for sightless people a small number of persons were asked to test and give feedback for a few methods that developers wanted to use. Most of the future apps relied on the feedback given at the beginning of the studies and continued improving their apps relying on that. This is why now many apps involve speech recognition, magnifying text and easier gestures for different tasks.

Relevant links - Related articles and books:

- authors and research teams:

One study about developing a mobile application based on voice and gestures:
https://link.springer.com/article/10.1007/s11277-019-06990-y?fbclid=IwAR3j2ltlKxsBCzF2Il6swP0Ovpfhx4VAOTITcYvbbpomERVVQ62j2Ill8W4
Another study about how to design a good app:
https://dl.acm.org/doi/10.5555/2729485.2729491?fbclid=IwAR3Up0KV9vMODPvJCyli0giW6dhKq2mCzk-uqYFpZBMenXKLo3er6Np0eLk

Book:
https://www.researchgate.net/publication/321319458_Designing_Mobile_Applications_For_Visually_Impaired_People
Article about how to design an app for visually impaired:
https://medium.com/@AlastairCraig86/designing-and-developing-your-android-apps-for-blind-users-part-1-cc07f7ffb5df
Books:
-Reddy, B. R., & Mahender, E. (2013). Speech To Text conversion using android platform. International Journal of Engineering Research and Applications,3(1), 253–258.
-Frey, B., Southern, C., & Romero, M. (2011). BRAILLETOUCH: Mobile texting for the visually impaired. Lecture Notes in Computer Science,6767, 19–25.
-Fakrudeen, M., Yousef, S., & Miraz, M. H. (2014). Finger based technique(FBT): An innovative system for improved usability for blind users' dynamic interaction with mobile touch screen devices. In Proceedings of the World Congress on Engineering, London, UK (Vol. 1, pp. 128–133).

More articles, books and studies can be found in the References sections at the end of every link.

Resources and tools - APIs, text-to-speech, java and android, front-end technologies and frameworks:
https://prezi.com/kxpsx9x0rnhw/romanian-speech-recognition/
https://developer.android.com/about
https://developers.google.com/voice-actions/system/
https://developers.google.com/gsuite/guides/android
https://medium.com/@devathon_/10-best-android-frameworks-for-app-development-in-2020-98f5afb300e9