**Usage of WebRTC in a cross-platform developed hybrid app**

Web Real-Time Communication (WebRTC) is an open source project that enables peer-to-peer real-time communication with video streams and voice calling in a 100% encrypted environment. The substantial advantage of WebRTC is that it does not need any plugins or external software, it can be used directly in the web browser. This offers developers the possibility to write real-time communication web applications without the knowledge of telecommunication technology. However, while web applications offer a considerable amount of options, they lack some of the possibilities that native apps offer, such as full access to the device’s media units, sensors, file system and features like the address book or calendar.

Native app development often poses a problem for companies because it requires the same programming logic to be implemented on various platforms, such as Android or iOS. One economic approach to this problem is cross-platform app development. It enables developers to write the programming logic only once and generate apps for multiple platforms from this code base. This brings the significant advantage of not having to write the same code for every target platform. One common approach in cross-platform development are hybrid apps. These apps are native apps that consist of a WebView. The application logic is written as a combination of web technologies like HTML, CSS and JavaScript and will be rendered inside of the WebView, which acts in a similar way to a web browser.

In order to use WebRTC in a cross-platform hybrid app, it is essential that the integrated WebView fully supports WebRTC functionality. Due to the fast-evolving nature of this technology, it is possible that common cross-platform app development frameworks do not support the latest version of WebRTC, or maybe do not support it at all. This poses a serious problem for the usage of WebRTC in cross-platform development. Currently, there are two frameworks that enable the usage of WebRTC in cross-platform apps: Crosswalk and OpenWebRTC. Both frameworks are open source and free-to-use and ensure that programmers can use WebRTC in the same way as in a web application for a browser.

This thesis should provide a comprehensive overview of the available options to use WebRTC in cross-platform app development. At the beginning, the main components and advantages and disadvantages of cross-platform app development will be discussed along with the particular features of hybrid apps. Afterwards, a comprehensive overview of the setup, functionality and distinctive characteristics of the available frameworks will be presented. To evaluate the strengths and weaknesses of these frameworks, a prototype application with basic WebRTC functionality – start a peer-to-peer video chat with another user – will be implemented in each framework. The frameworks and their prototype applications will then be evaluated with regard to a variety of qualitative and quantitative criteria, including size and memory usage of the generated app, range of features of the framework and supported platforms as well as the users‘ perception of the generated apps regarding the quality of the video stream in comparison to the existing web application. Conclusively, all insights and experiences from the prototype development will be discussed in detail and a recommendation regarding the usage of WebRTC in cross-platform app development will be issued.

For the future, the developed prototype application could be extended to a fully-functioning application. This would require the implementation of user management functionality on the web server to carry out basic tasks like signing up, authenticating and logging users in and out of the application.

Another possible extension would be the possibility for more than two users to communicate at a time. A Multipoint Control Unit (MCU) will be necessary to implement on the web server to enable this functionality.