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# Social media platform development with React Native

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<p>The topic of this thesis is “Social media platform development with React Native”. The principles of social media and the fundamentals of React Native in particular and Mobile development in general are presented in this report. Also, the definition, history and the duality of social media will be discussed. This study aims at demonstrating how to create a social media platform with React Native step by step.</p> <p>React Native was developed by Facebook. It is based on JavaScript and was used to create a cross-platform application in both iOS and Android devices. React Native uses built-in native components to develop user interface elements for mobile application. As a result, React Native is quite different from React, which uses web components. They are both popular platforms, two out of three biggest social media platforms are using React and React Native, namely Facebook and Instagram.</p> <p>As a result of this study, an application to share videos using React Native was built.</p>	
Keywords	React, React Native, social media, mobile development

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## List of Abbreviations

SMBs	Small Medium Businesses
ES6	ECMAScript6
ES5	ECMAScript5
JSX	JavaScript XML
UI	User Interfaces
UX	User Experiences
UCD	User-Centered Design
AI	Artificial Intelligence
IDE	Integrated Development Environment
NPM	Node Package Manager

## 1 Introduction

The purpose of this study is to demonstrate the use of React Native in developing a social media platform for mobile devices. Social media will be discussed from many angles. How to use React Native to create a social media platform and solve some of the problems will be analysed.

The global smartphone market is controlled by two companies and their two operating systems: Google with Android and Apple with iOS. Evidently, there is a big gap between these two platforms which requires developers to be familiar with two different programming platforms such as Java/Kotlin for Android or Objective-C/Swift for iOS, to manage with both. Thus, a cross-platform mobile application is needed to reduce time and effort in development.

React Native is an open source cross-platform JavaScript framework, which is based on the React framework, to solve the above-mentioned problem. React Native was published by Facebook on March 26<sup>th</sup>, 2015. [1] For the first, the concept of “code once, run everywhere”, which can be understood as code one time with React Native and achieve two versions in iOS and Android, was implemented in mobile development. JavaScript has been one of the most popular programming languages for the last ten years and that would bring a promising future for React Native. In figure 1, salary for developers and number of job openings for popular programming languages in 2019 is illustrated. JavaScript comes in the third place.

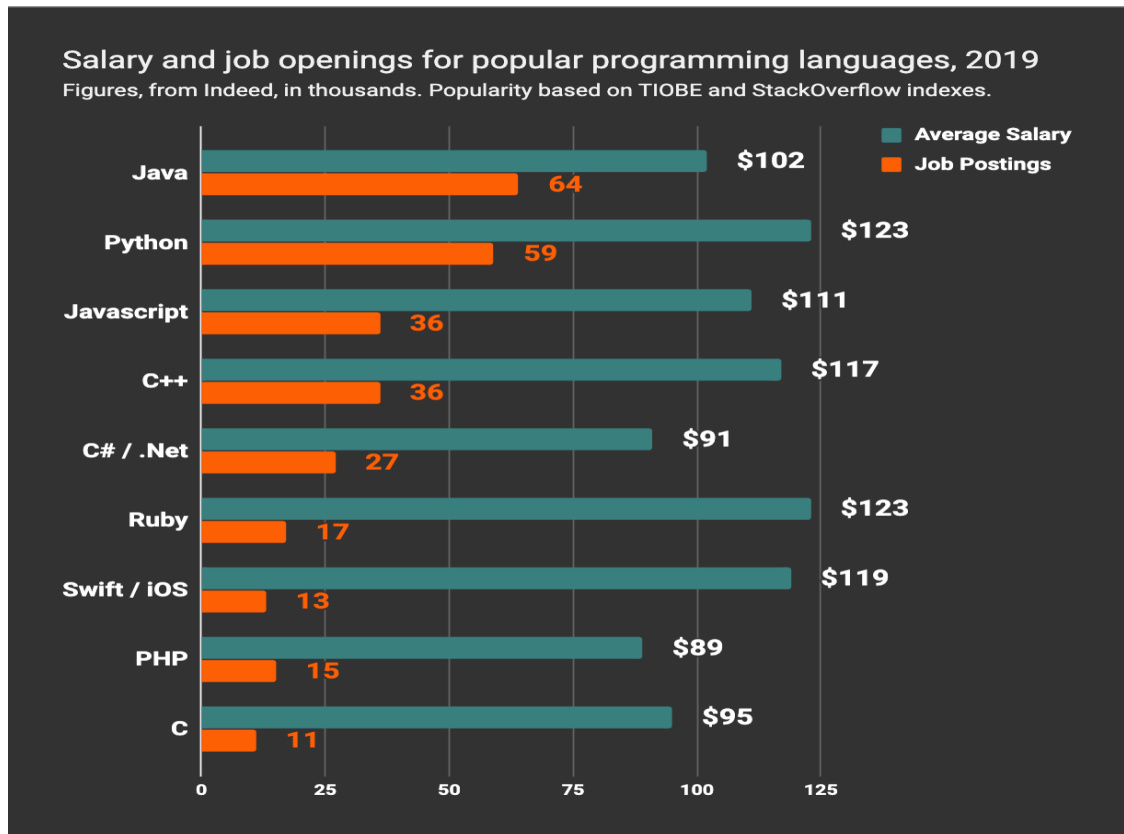


Figure 1. Salary and job openings for popular programming languages in 2019 [2]

This thesis also focuses on social media. The definition, history and the duality of social media will be analysed. The aim of the application which is illustrated in case study is to present some solutions for the existing problems in social media.

## 2 Social media

### 2.1 Definition of social media

The definition of social media is still unrecognized because it is defined by the purpose of the users. [3] Now, there are many definitions of social media. Some of the definitions are mentioned below:

Social media are bilateral internet-based technologies that promote the creation or sharing of contents such as information, ideas, career interests and other forms of statement via virtual communities and networks. [4] Social media is also a shared term for websites and applications which concentrates on connection, society input, cooperation, content-sharing and participation. [5]

Social media has been defined by Axel Schultze as, "Social media is the collection of tools and online spaces available to help individuals and businesses to accelerate their information and communication needs". [6] According to Anvil Media, "Social media is an umbrella term that defines the various activities that integrate technology, social interaction, and the construction of words and pictures". [7]

Summarizing all above definitions of social media, the general meaning of social media can be considered as an internet-based application that was designed for the users to share information, opinions, visuals and communicate with other by form of texts, pictures, sounds, or videos in a virtual community, privately or publicly. Along with the development of internet, social media is growing constantly. Social media is compared with institutions such as politics, economics, technology, education, entertainment, and health services.

### 2.2 The evolution of social media

In the past few years, the number of social media platforms is increasing rapidly along with the need of internet users. Nowadays, brand-new-internet-users can easily choose



a social media platform to start base on their purpose. There are some memorable milestones in the evolution of social media.

### 2.2.1 From 1995 to 2001

*Classmates.com* is declared to be the first social media platform. In 1995, the number of users in *Classmates.com* was recorded about 50 million people. [8] In the beginning of internet era, *Classmates.com* was the only social media platform to have a massive number of users. The record of *Classmates.com* remained for 4 years after the rise of *Habbo.com*. The service of *Habbo.com* began in 2000 with 117 million users in over 150 countries by Sulake, a Finnish corporation under the Azerion network. [9] During that time, there were some other platforms to compete with *Habbo.com*, for example: *Xanga.com*, *Deviantart.com*, but *Habbo.com* was still remaining as the largest social media platform.

### 2.2.2 From 2002 to 2006

Between years 2002-2006, the explosion of social media had been saturated because the number of users on every platform was about millions. In 3 years, from 2003 to 2005, Myspace, Facebook and YouTube had begun their journeys and immediately became the top used social media platform. The number of Facebook users was 300 million; Myspace had 263 million users in 2005. YouTube also showed impressive achievements. According to a research in 2006, 100 million videos had been watched and 65.000 videos had been uploaded to YouTube daily. [10]

### 2.2.3 From 2006 to present

At the moment, Facebook and YouTube is still the leaders of the industry. The number of users is now billions, and social media has already reached every corner of the Earth. Also, the amount of social media platforms is constantly increasing. There are some noticeable candidates that have the potential to conquer the market, such as: Instagram, WhatsApp, TikTok.

## Number of people using social media platforms, 2004 to 2019

Estimates correspond to monthly active users (MAUs). Facebook, for example, measures MAUs as users that have logged in during the past 30 days. See source for more details.

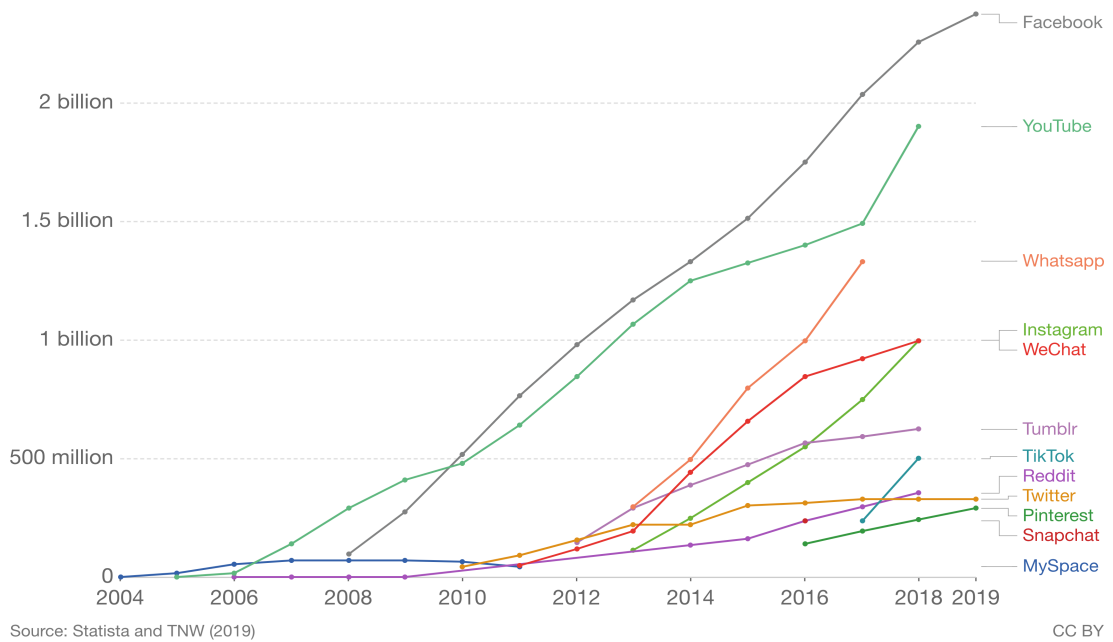


Figure 2. The number of people using social media platforms, 2004 to 2019 [11]

### 2.3 The duality of social media

Over the past decade, social media have built up its impact and dominated the internet. Many people claim that social media is playing an indispensable part of their lives. In 2007, people spent more than two hours a day on social media, which is a third of their daily internet activities and still increasing. [12] The advantages of social media are indisputable but there are also many problems with wide use of social media. The duality of social media is discussed below.

#### 2.3.1 The bright side of social media

The first advantage of social media is intensifying the connection between relatives, friends or even strangers. With the help of social media and internet, people have surpassed the geographical distances to communicate all over the world. Besides that, contacting with social networking seems to be more accessible than in person. According to

a research on teenagers, two-thirds favor online communication over face-to-face talks with friends. [13] Although online communication cannot replace real-world communication, it is undeniable that with social media, people are now more connected than before.

Secondly, social media have been helping marketing in particular and economy in general. Small Medium Businesses (SMBs) seem to be the model of economy that depend on social media the most. In a research of LinkedIn on 998 SMBs in Canada and USA, 81% of SMBs are current users of social media and 9% are future users. Gaining new customers is always the most challenging problem and 61% of the SMBs on that research believe that social media is the answer to that problem. [14]

Finally, education benefits from social media because many benefits for students and teachers are provided by social media.

#### The dark sides of social media

Every benefit also comes with negative consequences and social media is not an exception. Thus, the more people get into it, the more problems this may cause. The majority of people on social media are just socialising but a study published in “Computers in Human Behaviors” revealed that the majority of us are using social media as a means of getting information. [15] If you feel lonely, seeing other people living an interesting and active life can be depressing. [16]

However, consuming information is one of the main purposes of social media. Social media provides news for 68% of U.S adults and to one-in-five, social media is the regular place to get news from. [17] Since the background of news on social media is not checked, this may result in fake news and toxic content. Children are most vulnerable target in this problem. Even though the problem has been taken seriously from parents, by blocking sites from their children, it may get even worst if there is no solution from the social media managements.

Social media has about forty-five percent of the world’s population as its users, which means a staggering 3.48 billion people uses at least one form of social media. These connections lead to a worry of privacy security. When personal data falls into the wrong

hands, it may cause serious repercussion. Facebook, which has the largest number of users as a social media site, has reported several times that are leaking personal information of users to advertising and Internet tracking companies. Since departing from social media is insurmountable, consciousness of protecting yourself on internet becomes the most important thing to do.

### 3 React Native

JavaScript is one of the most widespread programming languages. Alongside with HTML and CSS, JavaScript is at the heart of the World Wide Web technology. JavaScript empowers interactive web pages and is a fundamental part of a web application. It is a high-level, just-in-time compiled, object-oriented programming language that conforms to the ECMAScript specification. JavaScript has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions. [18]



#### Most Popular Technologies

##### Programming, Scripting, and Markup Languages

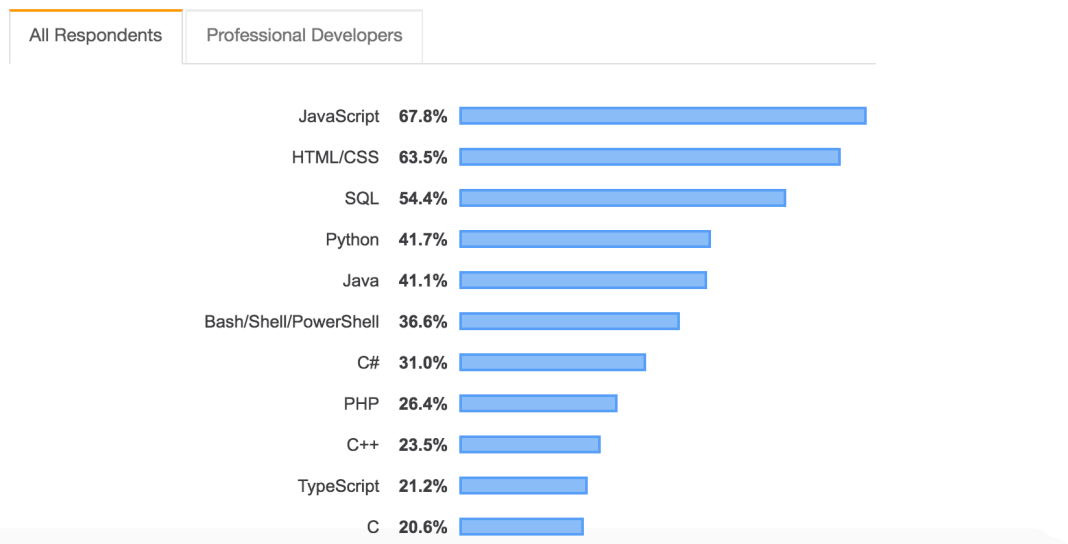


Figure 3. The most popular technologies in 2019

ECMAScript6, or ES6 is the latest and most important update of JavaScript. It was released in June 2015 and named ECMAScript2015 afterward. The full language was not supported by the web browsers but major portions are supported now. However, ES6 is still usable thanks to software called “transpiler” which can translate ES6 code into ES5, and which is supported on most web browsers. In ES2015, there are some new features that matter the most such as classes, inheritance, arrow functions and promises.

The original JavaScript can only be the tool to develop websites and applications, but frameworks that written by JavaScript can be used to abstract and complex logic, achieve cross-browser compatibility and speed up development. Today, there are many popular frontend frameworks using JavaScript, for example AngularJS, ReactJS, VueJS, EmberJS, BackboneJS.

### 3.1 React

React is a well-known open-source JavaScript library, which uses for UI for building with the support of HTML, which can also be known as ReactJS or React.js. React is a relatively new technology. It was first presented by Jordan Walke, a software engineer at Facebook in 2011. The very first application using React was Facebook's newsfeed in 2011. React became popular when Instagram picked it up and used in their system. With the success and fast-growing, React has become open-scourse in May 2013 at JSConf US. In 2015 JSConf, React Native was released to begin the era of cross-platform frameworks in mobile application development. [19]

With the appearance of React, Facebook has presented the solution for a gigantic problem: building a large application with data that changes over time. In detail, React was built to be declarative, which means the UI is rebuilt whenever there is a state-changing status from the application.

React has a component-based architecture, which focuses on the disintegration of the design into personal functions or logical materials that illustrates straightforward connecting interfaces included methods, events, and properties. A next level of abstraction has been provided by React. In problem solving, React also gives developers a new solution by dividing the troubles into smaller pieces, each take part in the component partitions. [20]

The main idea of high performance in React is Virtual DOM. React keeps looking for an internal Virtual DOM and uses Virtual DOM diffing to as similar to the actual browser's DOM. This provides browsers the ability to update only the changed components, instead of the DOM in total. The process is described in figure 4.

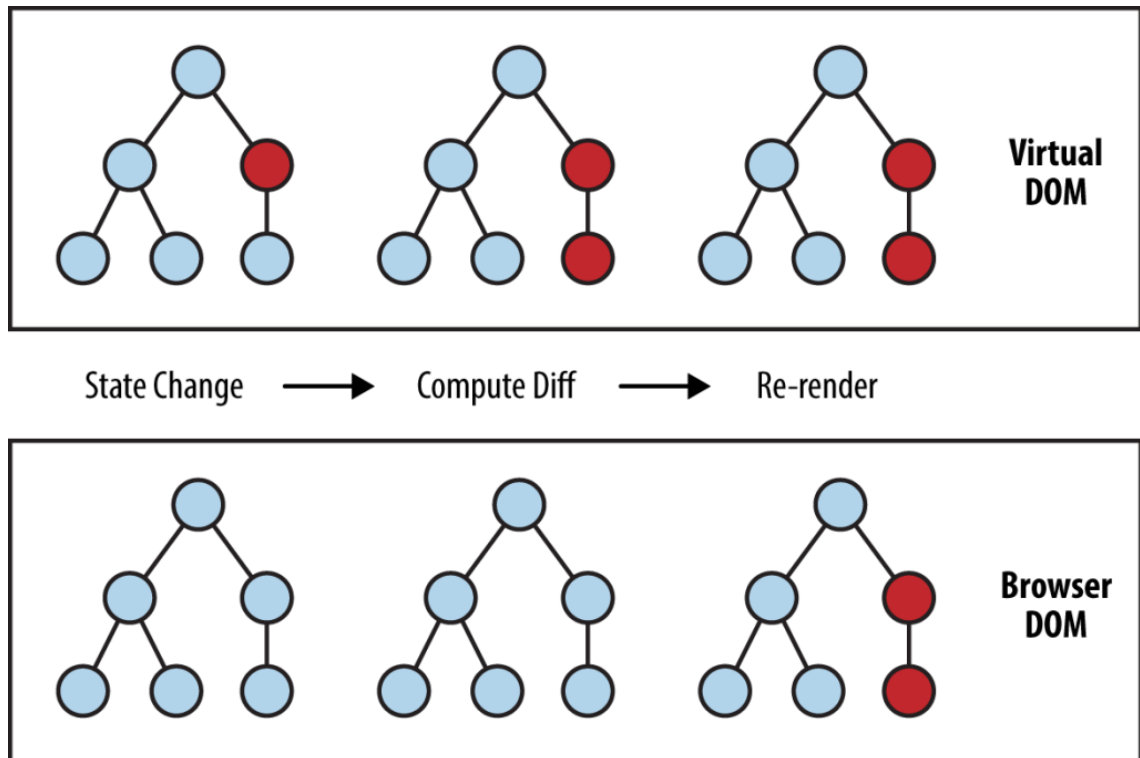


Figure 4. Rendering with Virtual DOM in React [21]

### 3.2 Mobile development with React Native

React Native, a React-based open-source JavaScript framework that uses to develop mobile applications for iOS and Android devices was released by Facebook in 2015.

The strength of React Native compared to traditional mobile application development is to provide a simple way of programming. One of the most satisfying things since React Native was introduced is that developers do not need to wait for minutes to build the application in order to see changes. Developers can also use their favorite development tools, because of the power of JavaScript. Last but not least, developers are not forced to use any native developing environment such as Xcode and Android Studio. However, Xcode is still needed to build an iOS application.

React Native was created with along with a new way of coding “Code once, use everywhere” so it is possible to apply the same source code for both iOS and Android

development. However, there are still some platform-specific functions which need to be solved independently but the percentage of reused code on real-world applications is still up to 87% such as in Facebook's Ads Manager. [22]

The biggest problem with React Native is that the framework is still developing, which means it does not have a large support community and document library. However, with its big rate of growth, the drawback will soon be fixed.

This chapter introduces four core features of React Native including: rendering, components, JSX, state and props.

### 3.2.1 Rendering

React Native application can run on particular platforms compared to native applications and one of the most important reasons for that is the usage of Virtual DOM. With the help of Virtual DOM, React can handle a much lighter DOM tree, which is related to the real DOM tree to achieve a performance boost.

Figure 5 presents the relation among application of DOM and Virtual DOM. The structure of Virtual DOM is decided by triggering events to the application by the input of the user to DOM, such as filling the text-field and submitting information by a button. At the same time, the Diffing algorithm will be repeatedly run to update the Real DOM.



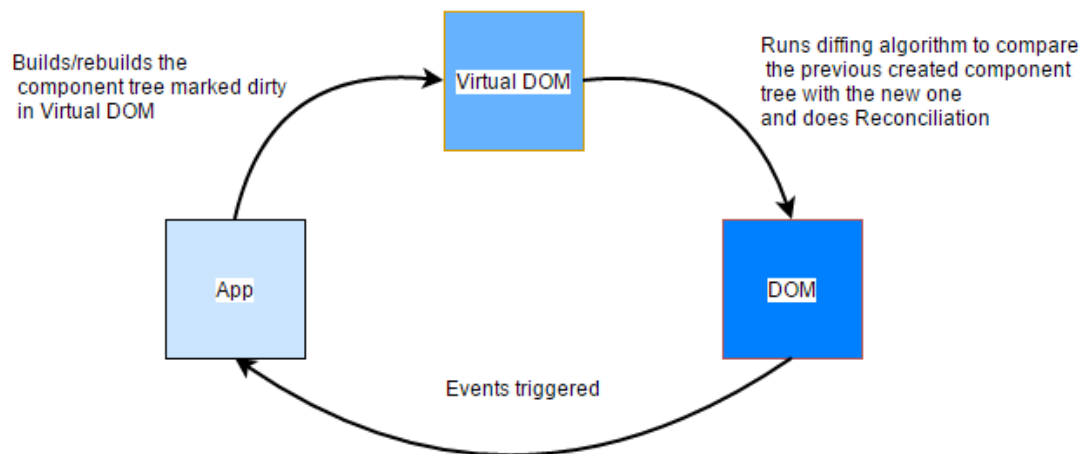


Figure 5. Workflow of Virtual DOM [23]

React Native, which uses JavaScript, brings a similar concept as the native applications in iOS or Android because of the usage of iOS and Android APIs. There is an abstraction layer between the look of the application and the real rendering of the elements, called the “bridge”. At this time, React Native can only run on iOS and Android but thanks to the Virtual DOM and the abstraction layer, React Native can run on other platforms in the future, just by providing another “bridge” component.

### 3.2.2 Components

React Native is a React-based framework so it is also a component-based architecture where each problem is solved inside the components. [24]

Component is a class or a function that receives inputs, for example: props, and return a React element, which define the look of a section of the User Interface. [25]

There are two types of components: cross-platform and platform-specific. A cross-platform component is a component that can be rendered on both iOS and Android. For example, component named `<View>` can be rendered as `UIView` on iOS and as `View` on Android. On the other hand, for example, to render a date picker in an application,

developers can only use `<DatePickerIOS>` on iOS or `<DatePickerAndroid>` on Android.

A component can be created by an extended-`React.Component` class that returns JSX in `render()` method. A simple example of a component is shown in Figure 6.

```
class Car extends React.Component {  
  render() {  
    return <h2>Hi, I am a Car!</h2>;  
  }  
}
```

---

Figure 6. Example of React component

### 3.2.3 JSX

One of the most observable elements in React Native, the view, is written by JSX (JavaScript XML), which is an extension to the ECMAScript standard and have a purpose to describe how the UI should show. JSX has solved the problem of separation, which means instead of having separate files for logic, mark-up and styles, developers can just put it into only one file. Figure 7 illustrates a common JSX fragment.

```
class ContainerComponent extends Component {
  state = {};

  someClassMethod = () => {};

  anotherClassMethod = () => {};

  yetAnotherClassMethod = () => {};

  render() {
    return (
      <div>
        <Header />
        <CreateResourceForm formSubmitted={() => {}} />
        <ResourcesTable />
      </div>
    );
  }
}
```

Figure 7. A component with JSX fragment

In figure 7, there is a component with logic code and JSX fragment, which handles UI, combined.

In React Native, CSS is the tool for styling objects and the JSX file can also contain the styles, which shows a big difference with CSS, where a global namespace for styling is needed.

### 3.2.4 Props and States

In React Native, data models are presented by Props and State. They have their own missions and effects to the main application. Most observably, Props are used to store and pass variables, which are set externally by the component's parent, and State, on the other hand, is directly initialized and managed inside the component's life cycle.

However, they are pure JavaScript objects and have a straight effect on the rendering process.

Props is the parameters to describe the component since its beginning, which can be simply understood as the configuration of a component. Props are immutable, once they are set, there is no way to change them later.

On the other hand, State can only initialize inside a mounted component and a new value can always be assigned to State whenever needed. A simple example about changing State is that every user's input should have changed the State of the component.

## 4 Case study: Developing a social media platform with React Native

### 4.1 Project Requirements

This chapter represents the process of building a social media mobile application with React Native. This application, called KidTube, is a personal final year project of the author of this thesis. KidTube is a video sharing platform designed exclusively for children and parents. The main purpose of the application is creating a safe and healthy entertaining environment for children by preventing toxic content.

#### 4.1.1 Functional Requirements

The first indispensable functional requirement for a social media application is authorization. Signing up is the first action in the authorization process. A new user needs to start their experience with their personal account. An account can be created by using email. The second action comes after the users registered in their account are logging in. During this step, the users can access to the application and use its features. The last action is logging out when the users finish their section. The most important qualification for this part is protecting users' information.

The second step, which is also the next function of the application is viewing contents. There are two common requirements for displaying-contents screen. The video needs to be played as smoothly as possible, depending on users' internet speed and after watching the video, users have the ability to leave their comments for the uploaders.

The last important action for the users is uploading videos. To become a decent social media platform, the application must provide the ability for the user to share their contents and it is a challenge to do that and keep the application away from toxic contents at the same time. Individual censorship is the answer for this problem. After a video has been uploaded by the user, it will go to a censorship process. There is a group of people that take the responsibility for checking the uploaded videos to block harmful contents.

#### 4.1.2 Non-functional Requirements

Besides the functional requirements, there are also non-functional requirements to be aware of as a software developer. These requirements determine the quality of the whole system. These characteristics can be named as beneficial user interfaces (UI), flawless and well-tested user experiences (UX), high performance, maintainability, security and reliability. Customer satisfaction is built on these requirements, missing one of these above may lead to a serious problem.

UI is the first consideration to be concerned about. A decent UI can be appraised by its understandability and versatility. It also needs to be matched with the preferences of the target users. In order to acquire all of these above requirements, the application designers should follow several specializations about designing an application for a mobile device. These principles are indicated by Apple, for IOS devices, and Google, for Android devices. These rules are included how to utilize and declare UI elements such as texts, buttons, lists... Besides that, determining a proper color pattern and theme for the entire application plays a big role in attracting users.

UX also requires elaborately design. A good application is incomplete without its impeccable function design. The application acquires straightforward features, especially for children. These include understandable errors displays and warning popups, avoiding unexpected crashing problems and unnecessary actions, and practical tasks. The application should also always tell the users about the process, where are they now and what should they do next. [26]

#### 4.1.3 Project design model

Based on the above requirements, User-Centered Design (UCD) is considered as the design model of the application. The UCD process characterizes the project by a design and development life-cycle focused on well-studied knowledge about the target users. [24] These are general phrase of the UCD process:

- **Specify the context of use:** Understanding target users, what their purpose is and when they will use the application.

- **Specify requirements:** Declare the requirements for the application to be a success.
- **Create design solutions:** Building from scratch to complete design.
- **Evaluate designs:** Testing with actual users for improving.

## 4.2 Project Implementation

### 4.2.1 Specify context of use

In this very first phase, describing target users is the objective to collect. There are two target users:

- **Children:** The main idea users of the application. KidTube is a video sharing network with content designed for children.
- **Parents:** These users are supporters to the main users. Parents should be the people to log in, searching for content, show it to their kids and upload videos.

### 4.2.2 Specify requirements

After marking the target users, a developer should demonstrate user stories for each user and accomplish the requirements for the application. By researching carefully, these are the users' requirements for the application:

- **No toxic content:** Parents do not want their kids to watch content that is not fit for them. This is the most crucial condition that cannot be failed.
- **Straightforward UI:** Parents might not have much experience with latest technology so the application needs to be easy to use.

- Attractive UI: To have attention of kids, the application should be designed to be colorful and entertaining.

#### 4.2.3 Create design solution

After considering all the requirements above, the mockups of the application have been designed.

With the development of Artificial Intelligence (AI), the censorship process that prevents toxic content to display in KidTube should become more accessible. Unfortunately, the study field of this project does not cover that area. Therefore, artisanal censoring process should be the solution for this problem. Figure 8 demonstrates the concept of this process. The moment when a video has been uploaded to the server, it should go to the censoring process. A person, called admin, takes the responsibility to watch the video and decide if it should appear in the application or not.



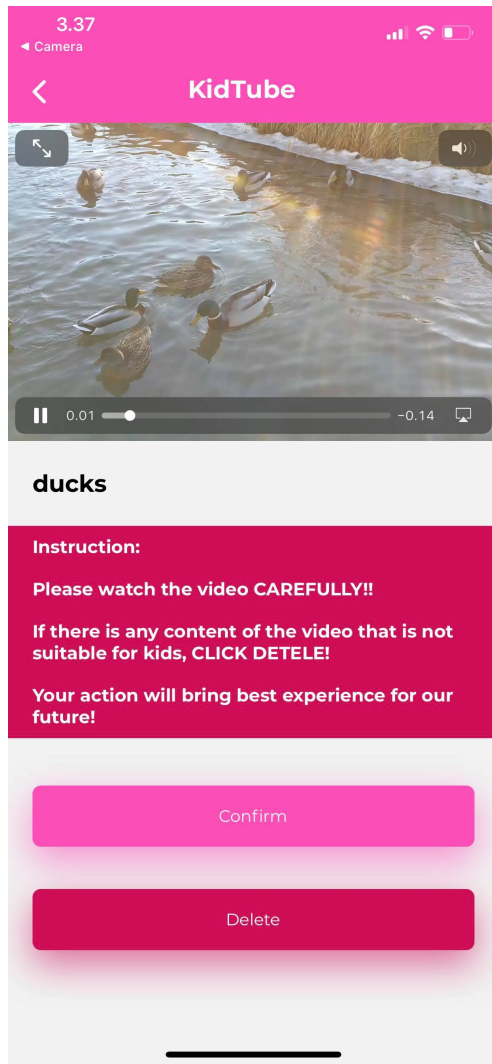
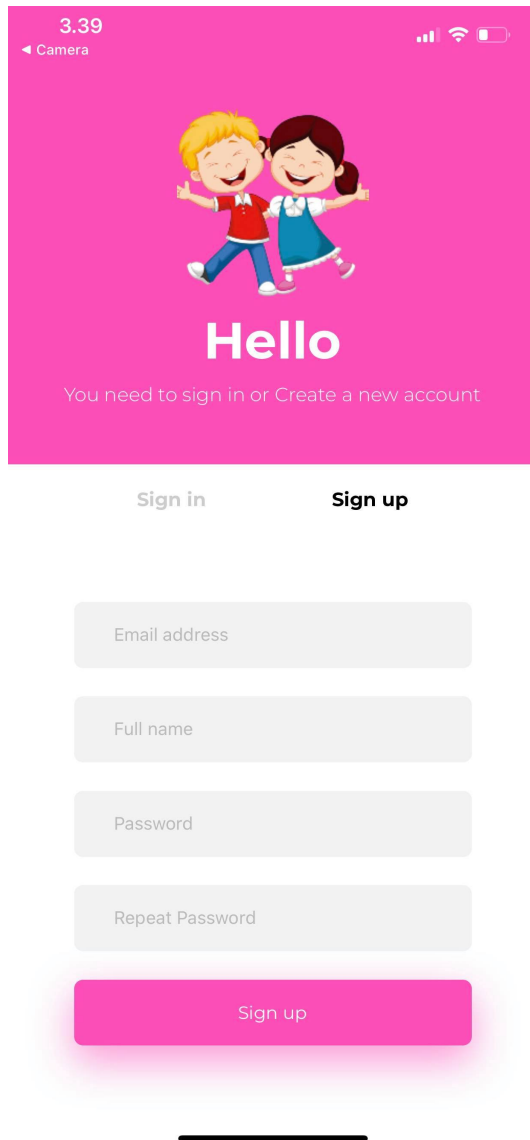


Figure 8. Censoring process of KidTube

Figure 9 represents the sign-up screen of the application. The text field and button has been designed to be easy to access with decent width and height. Parents should not face any contact problems when using the application. The color pattern with the pink as decisive color makes the application more attractive with the kids.



3.39  
◀ Camera

Hello

You need to sign in or Create a new account

Sign in      **Sign up**

Email address

Full name

Password

Repeat Password

Sign up

Figure 9. Sign-up screen of KidTube

#### 4.2.4 Developing the application

##### 4.2.4.1 Project initial setup

The first thing to do to get started with developing an application is deciding which Integrated Development Environment (IDE) to use. An IDE is a software application that arranges extensive abilities to developers to develop an application. [27] In this particular

project, Visual Studio Code has been chosen because of its lightweight running process and high integration with other tools and plug-ins.

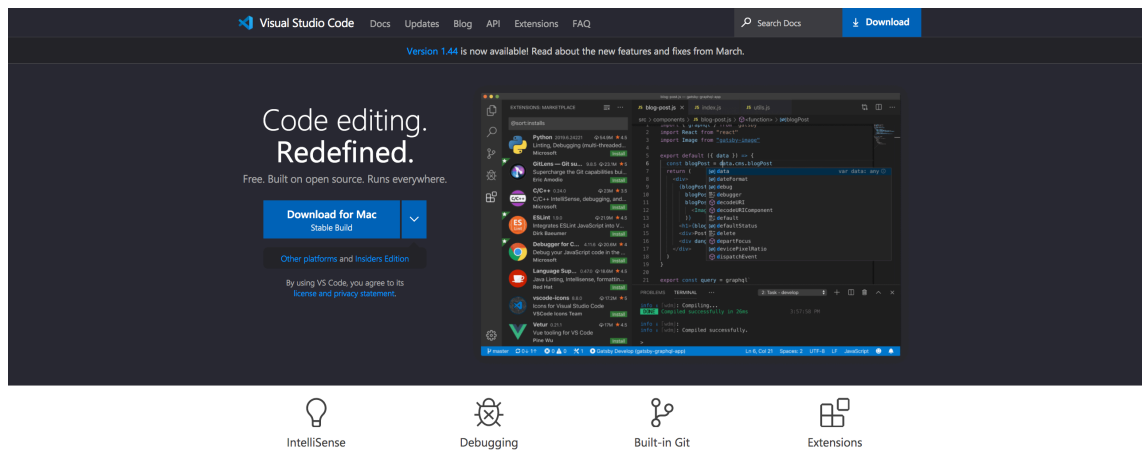


Figure 10. Home page of Visual Studio Code

The second step in setting up is installing Node Package Manager (NPM). NPM is the world's largest Software Registry, which contains over 800.000 code packages. NPM is an indispensable tool to use in React Native development in particular and JavaScript development in general. Different versions of NPM are available for developer to choose.

Node.js® is a JavaScript runtime built on [Chrome's V8 JavaScript engine](#).

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Figure 11. Download NPM

After installing NPM, there are some Node packages that need to be installed such as React Native, Expo, and React Navigation.

#### 4.2.4.2 Project features development

After finishing the setting up process above, the development of the application can start with the latest version of React Native.

The first basic feature to begin with is authorization. Authorization process are included sign-up, log-in and log-out. The design for sign-up action in figure 9 is similar to the design of sign-in action.

- The sign-up action is designed for new users. To participate in the application, each user needs a personal account. The account can be provided to the user after the sign-up action. Email address, username, and password are required in this section. There are some requirements for the information such as no duplicate username and email, no offensive username or no sensitive password.
- The sign-in action is to access to the contents inside the application. After getting a personal account from sign-up. users can use the log-in action to go inside the application. The username and password need to be matched with the information in the server.
- The log-out action is to stop using the application. Users can decide to stop using the application at any moment by using the log-out action. When log-out action is called, all of the information of the user should be wiped out and the user should be sent to log-in and sign-up screen.

The second feature of the application is presenting content. Video content in KidTube are displayed by `<FlatList>` component with custom items inside. Each item includes a thumbnail, video title, date and time, name and profile picture of the user that posted it.

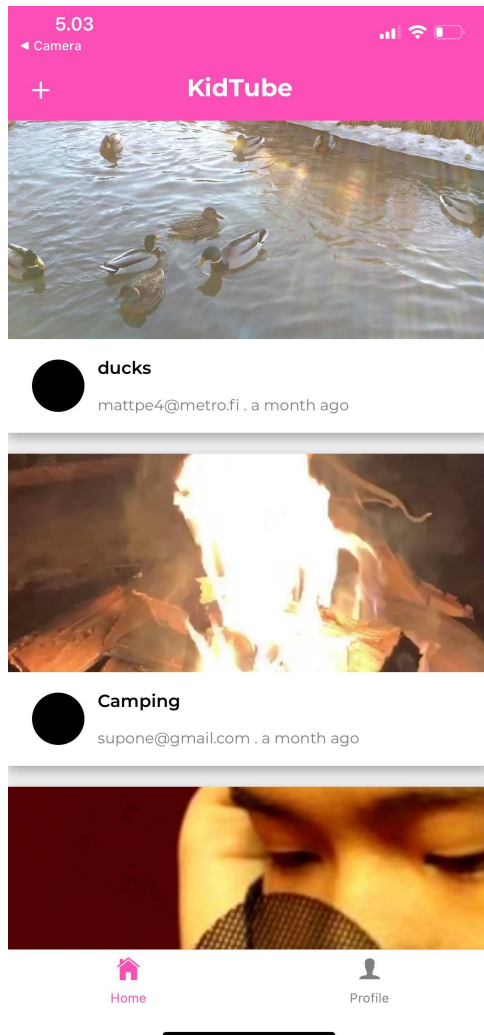


Figure 12. Main screen of KidTube

Users decide which screen is showing up next, based on their action. If users click the profile picture or name of the user who posted the video, they will be sent to screen that displays each video of that user. Otherwise, if users click at the thumbnail, they will be sent to video playing screen.

The video playing screen has two different sections. The first section is playing the video. In this section, a library called 'expo-av' has been used. The main purpose of the library is setting up a media player that can play videos with options for users such as volume adjusting and quality selection. The second section is commenting. Users have

the right to leave their opinions about the videos with this section. If the comment is proper enough, it will stay with the video for other users to read.

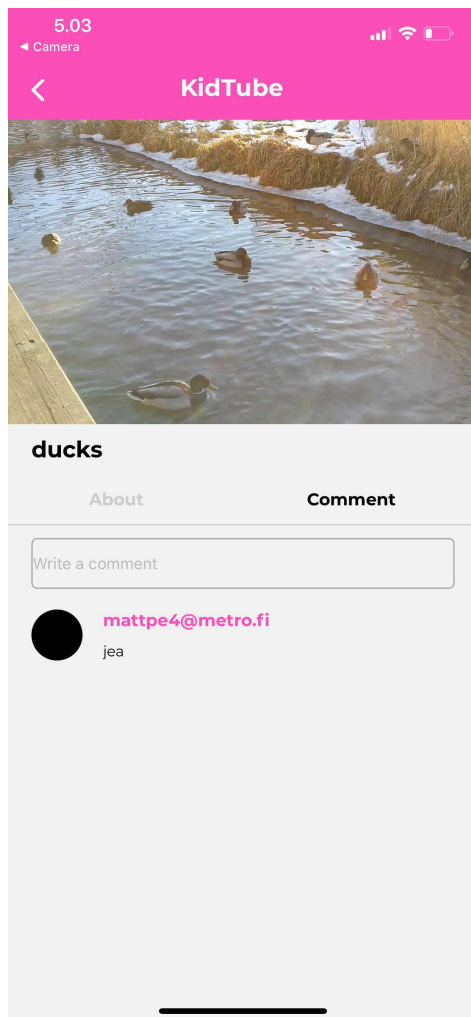


Figure 13. Media player screen of KidTube

Users can not only watch other users' videos; they can also upload their videos by clicking at the 'plus' button in main screen. After providing the title, description and the video itself, users can upload the video to the server. The video should be available after the censoring process mentioned above.

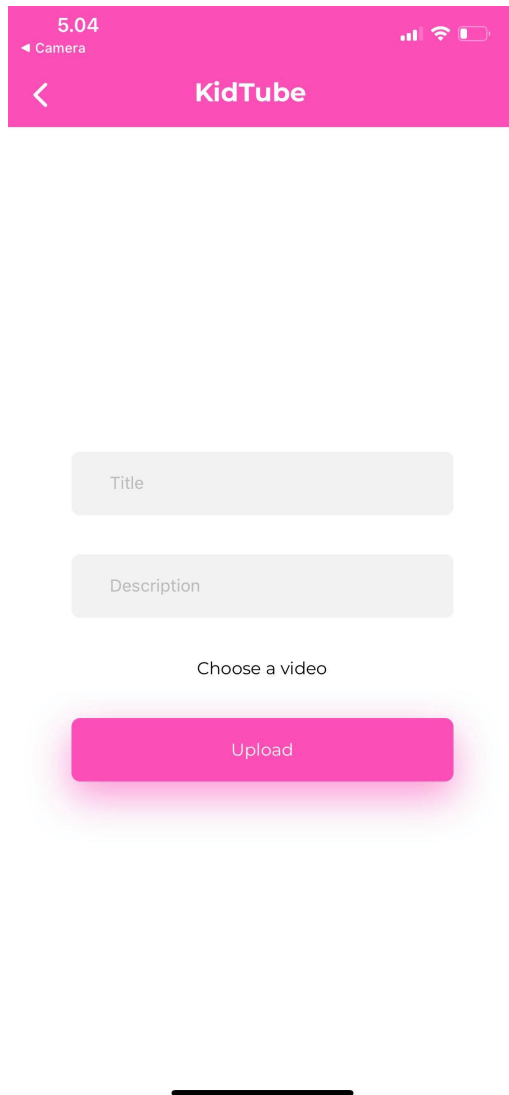


Figure 14. Uploading video screen of KidTube

#### 4.2.5 Evaluate designs

Based on the result of user-testing presented in appendix 1, the release of KidTube has received quantity of positive feedback from users. Censorship is the most successful feature of the application. By this process, KidTube becomes a safe and trustworthy place for children. The application is also smooth with transitions. By utilizing React Navigation, all the actions inside the application seem to be straightforward and easy to use. The color pattern is also a plus for the application.

Beside the positive feedback, there are some drawbacks that need improvement. In screens that need a virtual keyboard, the keyboard has covered the text field that makes it impossible to see texts. Warning pop-ups sometimes pop randomly, for instance when user finished sign-up action, a “Please check your confirmed password” pop-up has shown up for no reason.

Because the time for developing the application was limited, there are some improvements and new features that need to be updated in the near future for a better user experience:

- Fix reported errors
- Continue to test and fix undetected errors
- Apply AI to censoring process for a quicker solution
- Add editing video feature for uploaded videos.
- Create a follow-up system.



## 5 Conclusion

The rise of social media began for almost 20 years ago and there is no sign of its ending in the near future. The more people there are participating in social media, the more challenges there will be. Since the social developed without real responsibility from the developers, many people are now feeling unsecure about their privacy. Some parents are starting to prevent their children from using social media. On the other hand, social media has advantages that cannot be denied, which make avoiding it problematic.

In this study, a solution has been presented. By a responsible censoring system, KidTube will prevent almost all toxic content showing up in a children's application. The censoring system is mostly working flawlessly, as expected, but there will be problems if the number of users increases in the future. Artificial intelligence is the solution for this problem but AI was included in this study.

React Native preformed very well in this study. With the help of React Native, both versions of the application in iOS and Android meet the requirements for a stable application. Compared with other similar technologies, React Native has lots of advantages thanks to JavaScript community. There are several tools and libraries in JavaScript, created by the developer community which were used in this project and all of them were performing flawlessly. React Native code base is also maintainable and reusable because of its modular concept.

There are still problems that developers face while using React Native. In the newest version of React Native, there are components that only work well in one platform, iOS or Android, which makes the cross-platform development less efficient. Furthermore, React Native is still an immature framework, so when there is an update, developers need to pay attention to bigger changes within the entire framework. This could result in negative impacts on the applications.

However, React Native is a promising technology and it works very well for different purposes, not only in social media development. Facebook has taken a positive attitude towards React Native and the development community, which means this framework might have a bright future when it comes to application development.

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**User-testing result**

Name	Age	Good	Bad
Linh Chi Do	23	<ul style="list-style-type: none"> <li>- Smooth application with good performing.</li> </ul>	<ul style="list-style-type: none"> <li>- “Please check confirm password” showed up when register successfully.</li> <li>- Boring video</li> </ul>
Viet Phuong Ngo	22	<ul style="list-style-type: none"> <li>- Great looking, love the pink color.</li> </ul>	<ul style="list-style-type: none"> <li>- Don’t know what to do further, just watching some videos.</li> </ul>
Ty	6	<ul style="list-style-type: none"> <li>- Cute color.</li> <li>- Nice video about duck.</li> </ul>	
Thanh Thanh Huyen Nguyen (Ty’s mother)	29	<ul style="list-style-type: none"> <li>- Good looking application.</li> <li>- No toxic contents</li> </ul>	<ul style="list-style-type: none"> <li>- Kind of boring application.</li> <li>- A pop up showed when registered.</li> </ul>
Bich Lien Nguyen	55	<ul style="list-style-type: none"> <li>- Easy to use</li> <li>- Great looking</li> </ul>	<ul style="list-style-type: none"> <li>- Cannot see anything in text field because of the keyboard</li> </ul>
Anh Duc Tran	23	<ul style="list-style-type: none"> <li>- Good application</li> </ul>	
Nam Anh Nguyen Le	24	<ul style="list-style-type: none"> <li>- Smooth navigation</li> <li>- Great performance</li> <li>- Good-looking</li> </ul>	<ul style="list-style-type: none"> <li>- Pop-up bug when sign-up</li> <li>- Lack of features</li> <li>- Keyboard covered text field.</li> </ul>