Research Report

Technology Choice

1 INDEX

2 SETUP

2.1 GOAL

Before we can start the project, a decision will have to be made about what front-end technology will be used. With this research we want to give the product owner the information needed to make this choice.

2.2 RESEARCH QUESTIONS

2.2.1 Main question

What is the right front-end technology for this project with regards to the project's requirements, functionalities, the development team's capabilities, and security?

2.2.2 Sub questions

- What are the technical requirements for this project?
- Which front-end technologies does the development team have experience with?
- Which front-end technologies are viable that fit within the given requirements, and can be used by the developing team (or picked up within the given timeframe)?
- What are the pros and cons of these technologies with regards to the project requirements, functionalities, the development team's experience, and security?

2.3 HYPOTHESIS

A progressive web application using a JavaScript framework is the optimal choice for this project.

2.4 APPROACH

2.4.1 Interview

The members of the development team will be interviewed to get a list of front-end technologies they have experience with, and to get any personal preferences.

2.4.2 Literature study

A literature study will be done to get a list of possible technologies, and to learn about the pros and cons of these possible choices.

3 RESULTS

3.1 THE TEAM'S EXPERIENCE

Member	Role	Front-end Experience	Comment
Maik	Designer	- Android native - Progressive web apps	Only used plain- HTML, CSS, and JavaScript when developing the PWA's.
Ruben	Programmer	- Progressive web apps - React - Vue - IOS native - Android native	Limited experience with android native programming. Most comfortable with React.

3.2 TECHNICAL REQUIREMENTS AND FUNCTIONALITIES

The list of requirements and functionalities is still very limited. At the start of the project the following should be considered:

3.2.1 Android devices

Since this year Rwanda will be giving every family an android phone, one of the requirements for this project is that the front-end application should work on Android devices.

3.2.2 Donating

The main goal of the application is to facilitate donations towards the charity. To do this, the front-end solution needs to be able to handle payments.

3.2.3 Supply a wide user base

Donators are an extremely wide user base, so while android compatibility is a must, universal compatibility is extremely useful.

3.2.4 Low barrier of entry

It is safe to assume that most donors do not want to jump through too many hoops to donate their money towards a charity, so the barrier to use the application should be low.

3.2.5 Short timeframe

An application must be produced in a relatively short period of time.

3.2.6 Low/no costs

The application must be developed with low- to even no costs.

3.3 VIABLE FRONT-END SOLUTIONS

When considering the requirements, functionalities, and the team's experience, the following front-end solutions should be considered:

- Android native
- React PWA

- React native

3.4 COMPARING PWA AND ANDROID NATIVE

In this part of the research, we will be listing the benefits and drawbacks of progressive web apps and native applications that are most relevant to the current project.

3.4.1 Progressive web apps

3.4.1.1 Benefits
- Fast and easy download and installation process
- Universal compatibility
- Responsive design, so low costs to widely produce.
- No download required to use the application since it is available in the web browser.
- Easy sharing since the application uses URL's.
- No app store is needed.
- Uses the HTTPS protocol.

3.4.1.2 Drawbacks
- Very low IOS support
- There is no approval process, like reviews on an app store.
- Limited access to hardware components, which means you do not have access to features like GEO-fence and NFC.

3.4.2 Native apps

3.4.2.1 Benefits
- Faster and more responsive.
- Access to all hardware features the device provides.
- Integration with third-party apps on the device.
- Security

3.4.2.2 Drawbacks
- Only compatible with android devices.
- Higher download & installation barrier
- High cost

4 CONCLUSION

It is preferable to choose the development of a PWA when:

- You need easy distribution to a wide user base
- The available budged is low
- Indexing on search engines is important
- Universal compatibility is important
- Easy installation is important for the user base

It is preferable to choose the development of a native app when:

- It is necessary to move on the stores
- Speed and responsiveness are key points for the success of the app
- The app requires use of a specific set of hardware features of the device
- The app must be integrated with other third-party apps

The development team has more experience creating progressive web applications compared to native applications. This can be combined with either plain JavaScript, HTML and CSS or a JavaScript framework.

5 RECOMMENDATION

It is recommended to choose to develop a progressive web application. Since security is an important aspect this should be done using the JavaScript framework React.

6 REFERENCES

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7 REFLECTION

Since the subject of progressive web applications compared to native application is very popular there was a very rich source of literature information to use, so the research went well.

Before the research, the team members already had a slight preference for creating a progressive web application because of personal experience.