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TECHNOLOGY

MOBILESoft 2022

"Better Addressing Diverse Accessibility Issues in Emerging Apps: A Case Study using COVID-19 Apps"
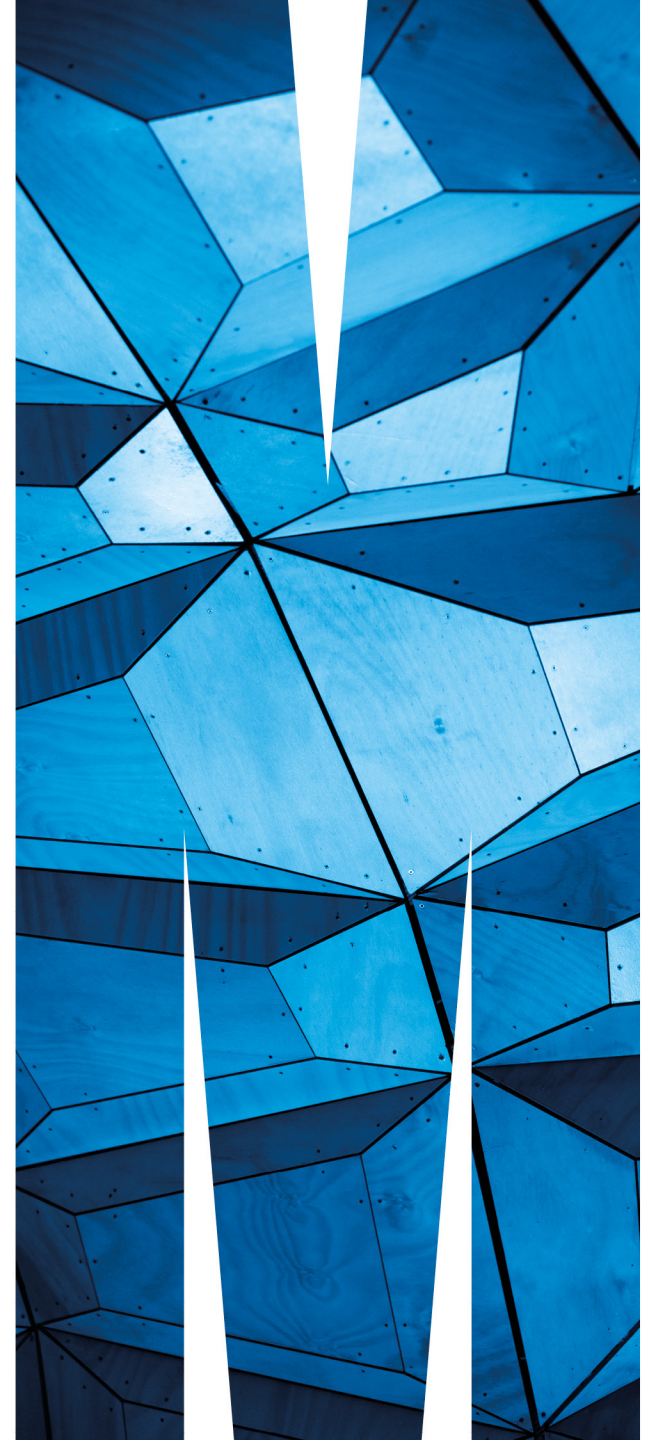
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GROUP
OF EIGHT
AUSTRALIA

Outline

❑Introduction and Motivation

❑Research Questions

❑Methodology and Main Key Contributions

❑Findings

Introduction and Motivation

Some Interesting Facts…

- The cycle of having new emerging **apps will likely reoccur in every upcoming emergency in the future** e.g. for advice and guidance during bush fires, floods, other pandemics, etc.

- **Governments were highly encouraging** for their residents to download and use COVID-19 apps.

- COVID-19 apps can play a very important role in stopping the global pandemic **if 60% of the public download and start using them**.

- Many users are **unable to download/use some COVID-19 apps** due to several issues.

Wider Definitions...

Emerging Apps:

Those mobile apps developed in the middle of an emergency situation such COVID-19 apps.

EMERGENCY

Accessibility Issues:

Those issues that may affect or prevent any type of users from downloading, logging into or using these emerging apps.
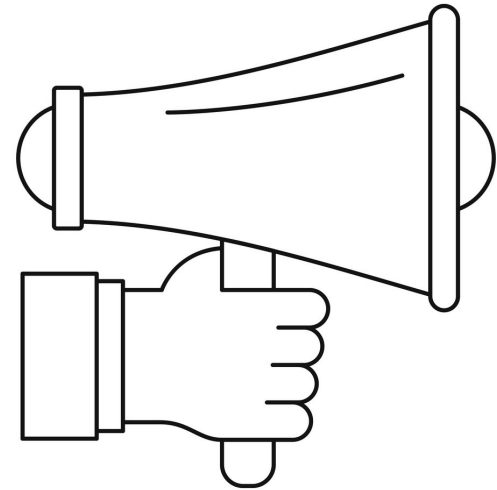
Why emerging apps?

- Emerging mobile apps can be beneficial to **decreasing economic loss** and **saving lives** during emergencies, pandemics, and crises.

- Emerging apps such as COVID-19 contact tracing apps are developed, designed, and tested in a **short time span** compared to other types of apps.

- They are required to be **rolled out quickly** to users due to an emergency or pandemic which leads to be more prone to **accessibility issues**.

The Situation in the Pandemic?

Governments and Health Experts were encouraging people to download and use COVID-19 apps and highly funding them

BUT?!

Many COVID-19 apps ended up having low adoption and download rates ...

COVID-19 (Emerging) Apps Development Challenges

COIVD-19 (emerging) apps should be **accessible** by everyone regardless of their age, gender, culture, etc since they are **saving lives**

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BUT...

By looking at the user reviews of COVID-19 apps
Thousands of users are raising and reporting **significant problems**

Research Questions

Our 2 Main Research Questions

- **RQ1**: What are the most common accessibility issues in emerging apps as evidenced in users' reviews and apps' version history?

- **RQ2**: How can we provide guidance to app developers to design and build more accessible emerging apps?

Methodology
and Main Key Contributions

Methodology

Extract and translate user reviews from both App Store and Google Play

↓

Automated classification of user reviews into several aspects

↓

Manual analysis of a sample of classified user reviews

↓

Manual analysis of apps' version history and description

↓

Develop an advisory tool for software developers of emerging apps

Automated and manual analysis of nearly **220,000 user reviews** of common COVID-19 contact tracing apps to identify **accessibility** issues faced by users.

A detailed analysis of the **version history release notes** of common COVID-19 apps.

Accessibility issues later fixed in COVID-19 apps

"

User Reviews:

COVIDSafe - Australia: "I don't have an Australian mobile number. The app doesn't allow foreign numbers. Oh well, 1★ "

ProteGO Safe - Poland: "Like polish apps always in polish only! I think when you spend 1 million zloty for the app it should be good to add some zloty to have it in English!, 1★ "

App Version History:

COVIDSafe - Australia: "More people in Australia can now download and use the app. We have added support to international and Australian External Territories mobile numbers."

ProteGO Safe - Poland: "Application translations added in English and Ukrainian"

"

Main Key Contributions (2)

Developing a **new tool**, the Emerging Apps Accessibility Evaluator and Recommender (**EAAER**).

Our developer evaluation of EAAER with 13 real-world app developers, indicated EAAER's **promise in supporting more accessible emerging app development**.

Our EAAER Tool

Part of the Questions in EAAER Tool

Will the app be available for download from the local or the international store?

ⓘ

| International Store | Only National Store |

What Android firmware versions the app support?

ⓘ

11 and above ▲▼

Part of the Recommendations

The app will only be accessible by users using the local app store. This will certainly reduce the apps accessibility to visitors, students, and immigrants from other countries as they will not be able to download the app unless they change their app store to the local one.

More details

It is specified that the app is only compatible with version 11 and above
According to Google, 17.73% of the users have version 11 and above
This means that your app will not be accessible by 82.27% of Android mobile users

More details

Findings

Major Findings

Many people can not **download or access** COVID-19 apps due to:

- Unable to **register**.
- Only support **national numbers** and/or require **national ID**.
- Only support the local **country language.**
- Do not support all **age-groups.**

Major Findings

- Several COVID-19 apps **are not tested** to be accessible by elderly or disabled users

- **No tools or guidelines** have been found to reduce/prevent accessibility issues while developing emerging apps.
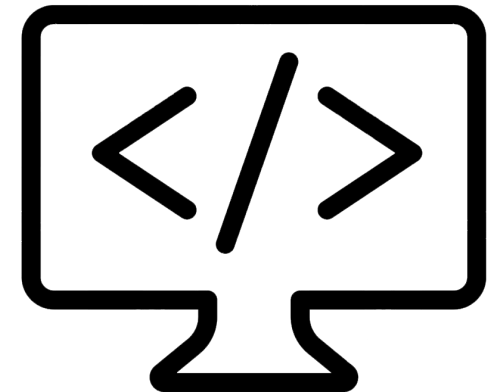
Acknowledgments

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Any Questions?

Thank you