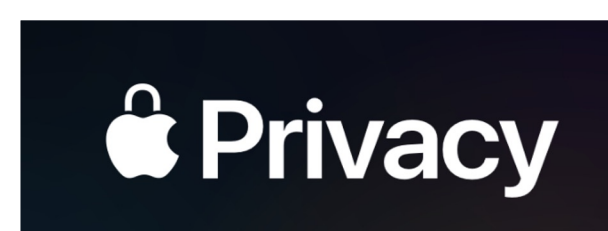


## Motivation and Research Question

- Users rely on application developers and mobile app stores to protect their data and privacy.
- As a result, mobile app store have established privacy compliance processes and requirements.
- However, prior research indicates developers' face multiple challenges when trying to achieve privacy compliance [1,2,3].

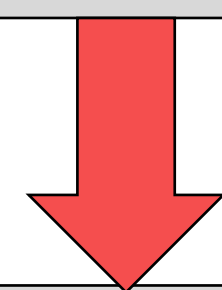
**RQ:** What challenges do developers encounter when trying to comply with Apple App Store and Google Play Stores' privacy requirements?



## Methods: Study Design

### Screening Survey

- Recruitment: Reddit developer forums, University channels, and course announcement boards.
- Eligibility: Participants in the US at least 18 years of age with previous mobile app development experience
- n = 644; q = 37



### Main Survey

- Design: multiple choice + open form questions
- Compensation: \$10 Amazon Gift Card
- Hosted on Qualtrics
- n = 30

**Our research methods were approved by CMU IRB.** Results were analyzed using statistical methods and qualitative coding

## Results: Developer Roles\*

- Frontend/backend Developer
- Full Stack Developer
- Android/iOS Developer
- Business Analyst
- UI/UX Designer
- QA Engineer
- Project Manager

\* Participants could select multiple roles

## Results: Navigating Mobile App Store Privacy Compliance is Challenging

### 1. Developers' play significant roles in Privacy Compliance

- **25 of the 30** participants reported being responsible for app privacy compliance
- **50%** worked independently, rest collaborated with privacy compliance team.

### 2. Navigating Compliance: Preferred Information Sources

- Developers commonly rely on **Stack Overflow, Reddit forums and colleagues** to overcome challenges
- Only **5 iOS developers** and **2 Android developers** directly reached out to Apple and Google for assistance
- Amongst cross-platform developers, **17 out of 24** reported seeking help from a privacy expert for **Apple's** privacy requirements, while **no developers** did the same for issues with the **Google Play Store**.

### 3. Leveraging Tools for Compliance

- Developers actively seek privacy tools and resources for simplified compliance processes.
- **15 out of 30** participants used privacy policy generators to quickly generate compliant policies.
- **10 out of 27** participants who develop applications for the Google Play Store utilized the latest Google Checks Audit tool.
- A similar tool from Apple would likely be useful to iOS developers.

## Conclusion and Future Research

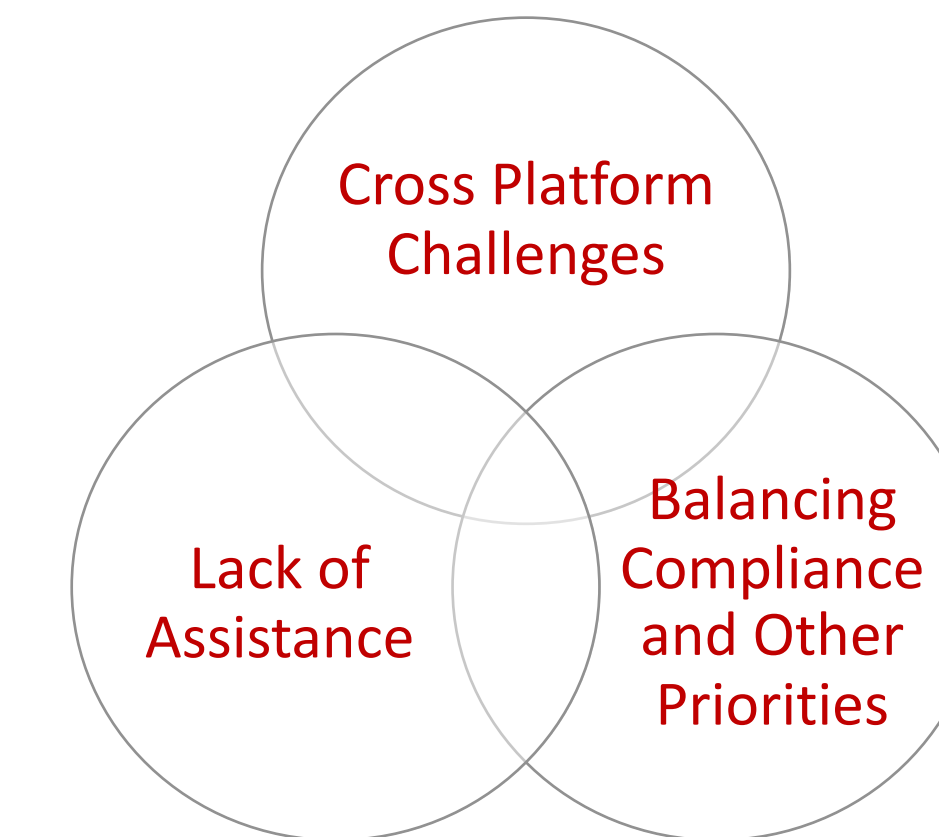
Our preliminary results provide valuable insights and highlight the need to simplify app store privacy requirements by offering clear guidelines, support resources, and compliance tools.

In future research, we aim to utilize the study results to conduct further investigations for a more in-depth analysis.

## References

- [1] LI, T., LOUIE, E., DABBISH, L., AND HONG, J. I. How developers talk about personal data and what it means for user privacy: A case study of a developer forum on reddit. *Proceedings of the ACM on Human-Computer Interaction* 4, CSCW3 (jan 2021), 1–28.
- [2] TAHAEI, M., ABU-SALMA, R., AND RASHID, A. Stuck in the permissions with you: Developer & end-user perspectives on app permissions & their privacy ramifications. *arXiv preprint arXiv:2301.06534* (2023).

## Results: Challenges and Expectations



Understanding unique privacy guidelines and requirements of app store platforms (Apple's App Store, Google Play) is a major challenge for developers, particularly newcomers.

"App store platforms such as Apple's App Store and Google Play have different privacy requirements, and understanding the nuances of these requirements can be challenging for developers, especially those who are new to the platform". (P2)

Developers expect app stores to provide tools, resources, and support to reduce their workload in implementing privacy requirements.

"App stores could provide support through education and training resources that help developers stay up-to-date with changes to privacy regulations and best practices". (P5)

Developers are facing extra challenges with app implementation due to conflicts between the compliance requirements and other priorities.

"Another challenge that we faced was implementing privacy requirements into our app in a way that is both effective and user-friendly. For example, apps may need to obtain user consent for data collection and use, but we as developers needed to balance this with maintaining a positive user experience". (P17)