

Motivation

- Long privacy policies fail in increasing people's awareness.
- Many visualizations are available; however, little guidance is available for designers and developers.

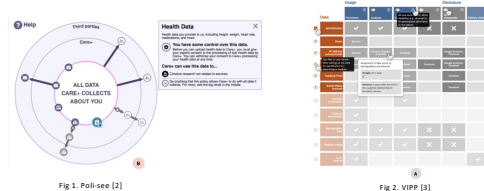
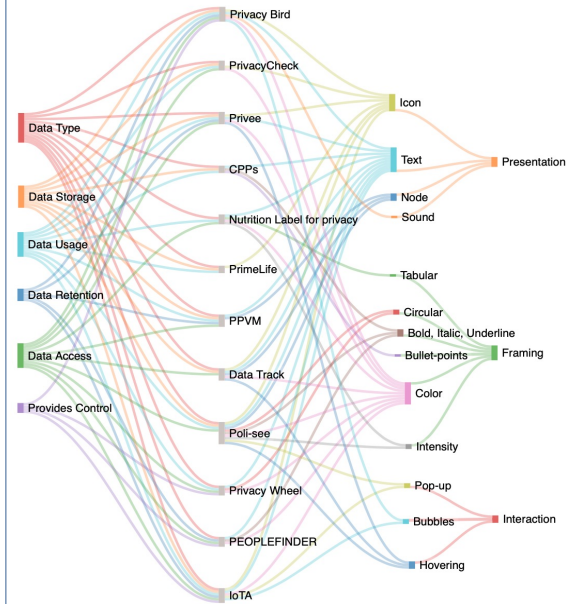


Fig 1. Poli-see [2] Fig 2. VPP [3]

The goal is to provide a knowledge base that will help develop better privacy notices to enhance awareness and control for IoT users.

Methodology

- Visualization solutions for privacy management are available on the web, mobile and IoT literature.
- Five major privacy management factors.
- Most existing privacy notification visualizations use a **three-step** design.

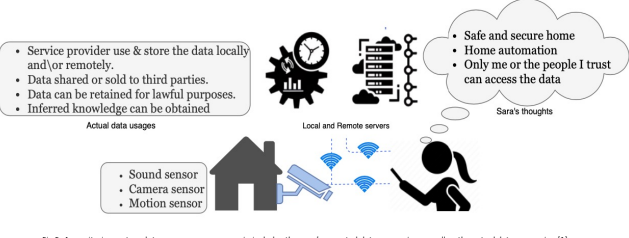


- ### Knowledge Base - Privacy Management Visualization Toolkit
- The toolkit:
 - Servers as a guide for future designers to create effective privacy notices visualizations.
 - Synthesizes the key privacy elements highlighted in previous research into a single knowledge base.
 - The knowledge base not only captures the most important privacy notice factors, but it also correlates with how these factors can be visualized to users based on previous research.



Fig 4. Privacy management (awareness and control) toolkit that can be used to create IoT privacy notices [1].

Demonstration



Service provider use & store the data locally and/or remotely.

- Data shared or sold to third parties.
- Data can be retained for lawful purposes.
- Inferred knowledge can be obtained.

Safe and secure home

- Home automation
- Only me or the people I trust can access the data

Sound sensor, Camera sensor, Motion sensor

Fig 5. A monitoring system data usage case scenario includes the user's expected data processing as well as the actual data processing [1].

Visa Privacy Notice

- Types of data we collect:
 - Presence
 - Image & Video
 - Audio
- We use the collected data to:
 - Increase Security
 - Conduct Analysis
 - Provide Personalized Ads
- We share the collected data with:
 - Authorised Parties
 - Third Parties
- The data we collect will be retained for as long as the user account is active, or for any other related and lawful purpose.
- The data we collect is stored in the country from which it originated, but we may also store your data in our servers in other countries.

Hover over the icons to learn more

Fig 6. Visa is a use case example that we developed which used a combination of text and icons from the presentation step with coloured, bold text and bullet point label framing and hovering interactive elements [1].

Conclusions Future Directions

- The toolkit:
 - Represents a comprehensive checklist of privacy notice visualization aspects.
 - Can simplify the privacy awareness check for both developers and IoT users.
 - Can function as a catalog of various types of privacy management visualization.
- A valuable research direction:
 - Examine whether the toolkit can be used as a foundation for developers when developing an IoT devices.
 - Investigate if the toolkit can be used as a checklist to verify privacy policies' effectiveness, structure privacy policies, or improve their readability.

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References

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 [2] Guo, W., Rodolizio, J., and Birkel, E. Poli-see: An interactive tool for visualizing privacy policies. In Proceedings of the 19th Workshop on Privacy in the Electronic Society (2020), pp. 57-71.
 [3] Reinha Rdt, D., Bo Rcha Rd, J., and Hu Rtienne, J. Visual interactive privacy policy: The better choice? In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (2021), pp. 1-12.

Full Paper

