How do Stakeholders Understand Privacy? Findings from In-depth Interviews about Differential Privacy

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Introduction

- Develop educational material, training, and outreach activities on the use of formal privacy in sample surveys.

- **RQ1:** What are the stakeholders' attitudes, perceptions, and participation levels toward privacy?

- **RQ2:** Is there a demand for the protections afforded by differential privacy?

- Qualitative interviews to gather information and establish a baseline with data privacy experts.

- Contrast the results using three overlapping questions from a survey conducted with the general population.

Introduction

Survey with the general population (Thanks to Trent Buskirk):

- Scrape post from Twitter.

- Identify users posting about privacy.

- Build a sampling frame.

- Sample selected in non-overlapping segments based on keywords content.

- Conduct a survey about privacy.

- **Three overlapping questions:**

- ➤ **Privacy definition:** How would you define "privacy" in your own words?

- ➤ **Privacy topics:** What privacy topic(s) are you most concerned about these days?

- ➤ **Privacy protection methods:** What types of privacy protection methods are you familiar with?

Pilot study design

Image by FreePik

US Census Bureau employees

Senior positions

19 years working for CB

Qualitative - Quantitative analysis

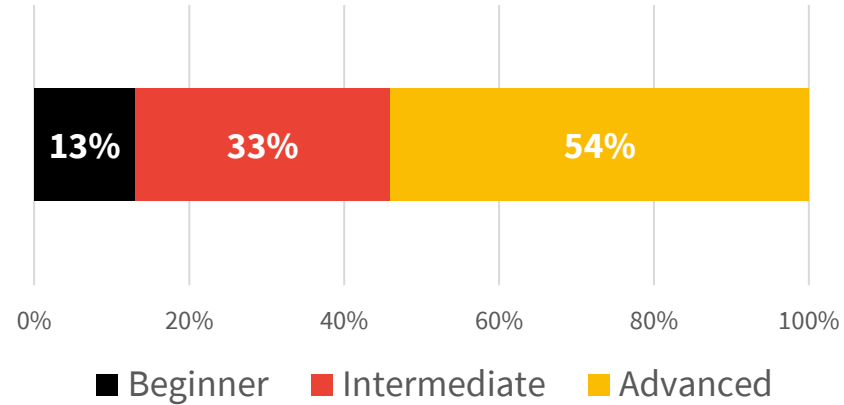AtlasTI and R

Privacy definition

Subject Matter Experts:

- Professional vs. personal life contexts.

- Privacy x Confidentiality x Identifiability

- The right to protect personal information.

Twitter Sample:

- The ability to keep personal information confidential and not for public consumption.

- Privacy is "the right to anonymity when you wish it to be maintained and the upholding of our 4th amendment at all costs." (Journalist)

Prior Experience with Confidentiality

Beginner	Intermediate	Advanced
13%	33%	54%

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Privacy topics

Subject Matter Experts:

- Respondent re-identification and accidental release.

- Confidentiality vs. identifiability

- Trade-off between privacy protection and usefulness of data.

- Explain the guarantee of DP to non-technical stakeholders.

- Unexpected use of location data and targeting by advertisers.

Twitter Sample:

- Lack of transparency and control of personal data.

- Risk of government surveillance.

Privacy protection methods

Subject matter experts	Frequency
Noise infusion	13
Differential privacy	11
Data swapping	11
Cell suppression	9
Synthetic data	8
Formal privacy	6
Top and bottom coding	6
Rounding	6
Aggregation / collapsing categories	4
Coarsening	2

Twitter Sample	Frequency
Laws and regulations	23
VPN	7
Encryption	6
Burner accounts	6
Private browsers	5
Two-Factor authentication	5
Limiting Smart Home Device Usage	4
Offline living	3
Passwords	2
Ask app not to track	2

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Differential Privacy
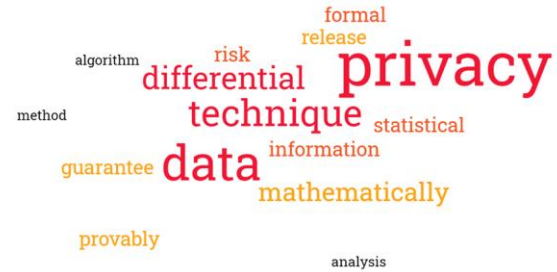
Subject Matter Experts:

- All the experts said they are somewhat or very familiar with DP.

- Theory vs. practice.

- 86% have used any privacy method.

- Definitions include words such as "formal", "mathematical", "provable" and "statistical".

- "We could use DP, whereas in a complex sample survey, the technology just isn't there yet". (Statistician / Mathematician)

Conclusion

- Subject Matter Experts differentiate privacy according to their job and personal life.

- Subject Matter Experts are more familiar with formal privacy techniques.

- Twitter sample talks more about laws, regulations, and best practices to increase online security.

- Survey data vs. "found" data.

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Thank you!

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