Data Protection, Privacy and Android Apps (inc. live hands on event)

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CAPrice
collective awareness platform for
privacy concerns and expectations

CAP-A PROJECT
A Community-driven Approach
to Privacy Awareness

DEVSTAFF COMMUNITY

Meetup 10/12/2020

Presentation Agenda

1 **Intro**
Big data revolution, apps, and data usage

2 **The problem**
What is the problem and the respective challenges
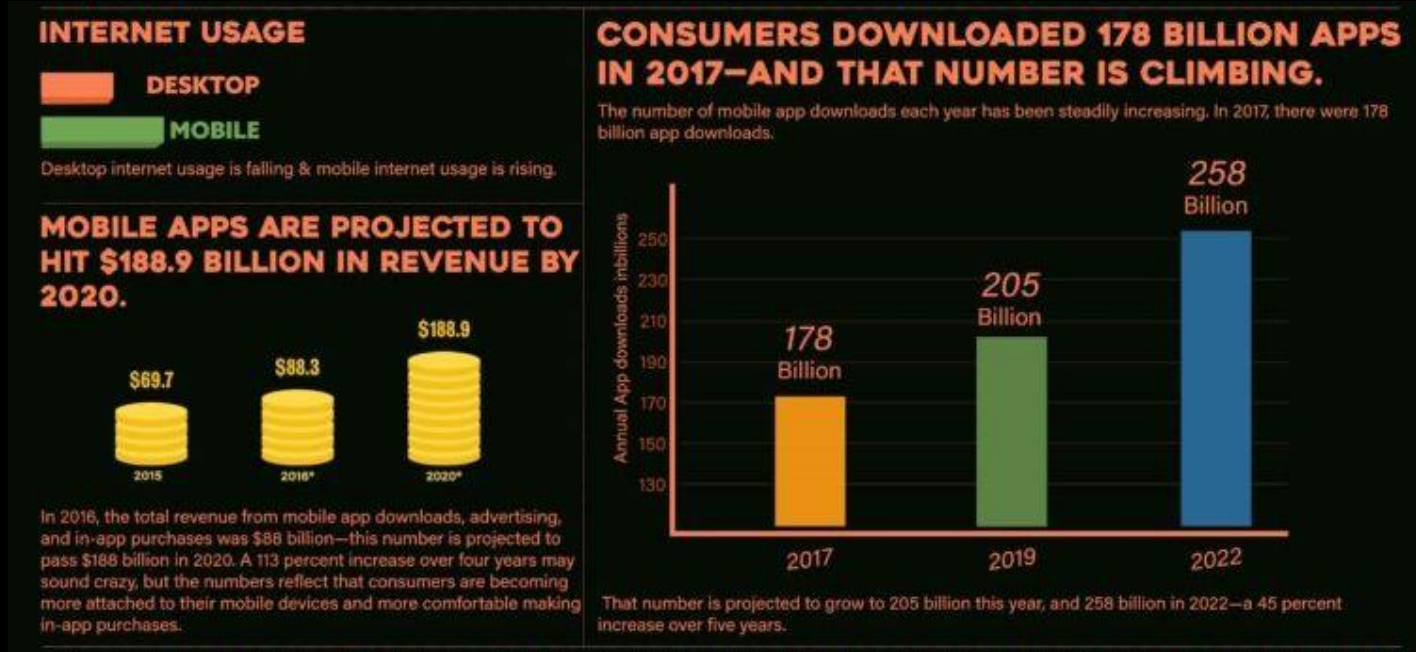
3 **Our solution**
What we propose, an overview of the CAP-A tools and our vision

LET'S TALK ABOUT DATA

Sources: Statista, Internet Live Stats, Expanded Ramblings, Association of City Transportation Officials, Wired

APPS (Market perspective)

INTERNET USAGE

- ▬ **DESKTOP**
- ▬ **MOBILE**

Desktop internet usage is falling & mobile internet usage is rising.

MOBILE APPS ARE PROJECTED TO HIT $188.9 BILLION IN REVENUE BY 2020.

$69.7 — 2015
$88.3 — 2016*
$188.9 — 2020*

In 2016, the total revenue from mobile app downloads, advertising, and in-app purchases was $88 billion—this number is projected to pass $188 billion in 2020. A 113 percent increase over four years may sound crazy, but the numbers reflect that consumers are becoming more attached to their mobile devices and more comfortable making in-app purchases.

CONSUMERS DOWNLOADED 178 BILLION APPS IN 2017—AND THAT NUMBER IS CLIMBING.

The number of mobile app downloads each year has been steadily increasing. In 2017, there were 178 billion app downloads.

- 178 Billion — 2017
- 205 Billion — 2019
- 258 Billion — 2022

Annual App downloads in billions

That number is projected to grow to 205 billion this year, and 258 billion in 2022—a 45 percent increase over five years.

Source: https://infographic.tv/infographic-mobile-app-usage-statistics-to-know-in-2019

APPS (Users perspective)

SMARTPHONE USERS

Social Networking	Music	Multimedia	Gaming	Photos	Instant Messengers	Retail	Search and navigation	News and information	Maps	Others
20%	18%	10%	10%	4%	3%	3%	3%	3%	3%	23%

87% ⊞ 13% www

Mobile users are spending 87 percent of their time in apps, versus just 13 percent on the web.

21 - 30 TIMES ♥

A majority of people use their favorite apps 21 to 30 times a day.

On average, a person now has more than **80 apps** installed on their phone

The average US consumer now spends **198 minutes** per day using apps and only **168** watching TV

198 MINUTES

168 MINUTES

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The Problem
vs.

Apps

- Request **access to a set of personal data** through device permissions

- The **privacy policy** of apps is described in documents which are **lengthy** and **hard to read** (legal terms, frequent updates)

- Apps use personal data for **several purposes** including advertising, user identification, vote manipulation and they enable **data sharing** with third parties

Users

- Users **grant all data access requests**

- Users **don't devote time** to read Privacy Policy documents

- In the end users **don't know** how their data is handled by the app

- They **cannot contribute** to improving the situation even if an legal framework across the EU exists (GDPR)
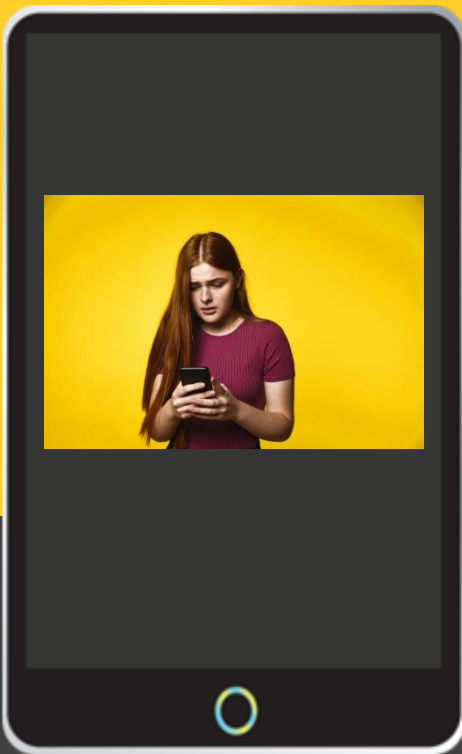
Our solution

01   **CAP-A Tools**
Users participate in the evaluation of apps

02   **Apps Metrics**
Results aggregated under two basic metrics

03   **Reward Mechanism**
User engagement and gamification

A crowdsourced-based evaluation of apps
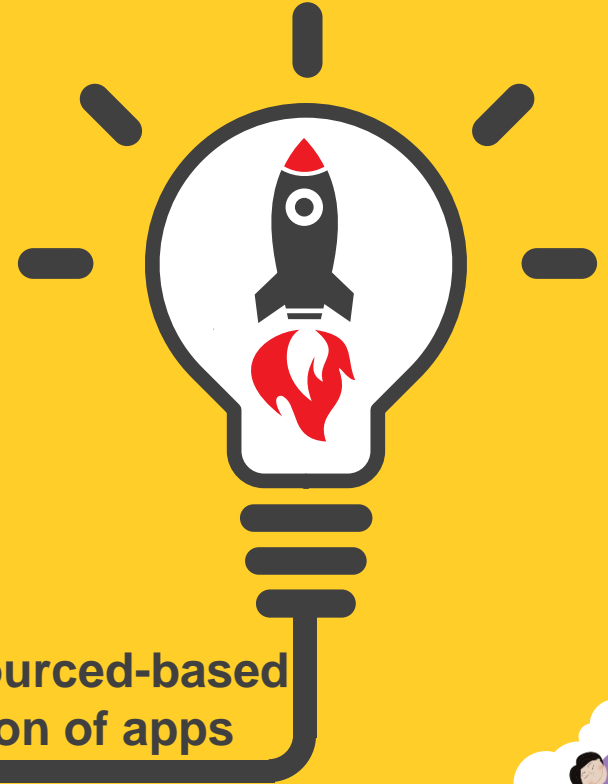
THE CAP-A Tools

The CAP-A Portal (Actions)

- Supports crowdsourcing actions for **evaluating privacy apps' behavior**

- These **actions** include:
  - 1) Express **expectations** on apps permissions

THE CAP-A Tools
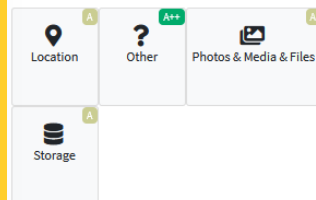
The CAP-A Portal (Actions)

- Supports crowdsourcing actions for **evaluating privacy apps' behavior**

- These **actions** include:
  - 2) *Share **evidence** links for articles related to privacy and specific app

*Available for Users+Developers

THE CAP-A Tools

The CAP-A Portal (Actions)

- Supports crowdsourcing actions for **evaluating privacy apps' behavior**

- These **actions** include:
  - 3) *Add **annotations** on privacy policy documents (PrP)

*Available for Users+Developers

THE CAP-A Tools

The CAP-A Portal (Devs)

- *Claim an app (for apps developers/providers):
  - Provide explanations about the privacy properties of the claimed app, in order to help build a trust bond with the CAPrice Community users

- The developers have the ability to add annotations and evidence URLs which are marked with a specific badge (developer)

- More information is provided in the https://cap-a.eu/portal/#tours

- Finally, developers can improve their apps based on the statististics offered by the portal

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THE CAP-A Tools

## The CAP-A Portal (Statistics)

- Through the dashboard, the portal provides interesting **visual representations of aggregated statistics** regarding users and apps

- **Leaderboards** with top-20 apps and top-20 users based on several criteria

- Identification of **patterns**, such as preferences or stances of specific user groups towards certain app categories (**privacy norms**)

- **Developers** understand how close their services are to what their clients wish. They can also help **policy makers** and users to identify trends

THE CAP-A Tools

The CAP-A App (@ play store)

✓ Audit installed apps

✓ Express privacy expectations

✓ Explore aggregated privacy information
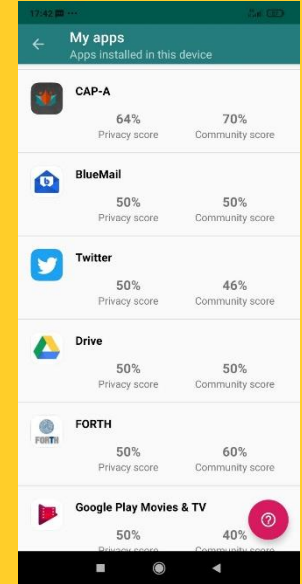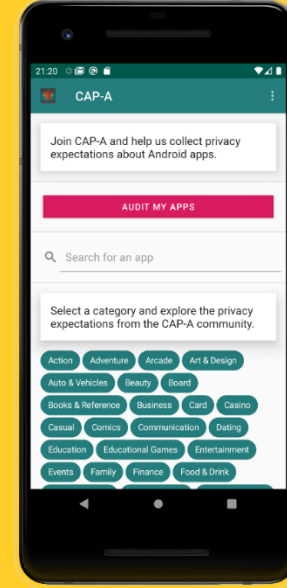
THE CAP-A Metrics

Users' input contributes to the calculation of evaluation metrics

✓ ## Satisfaction of Community's Expectations Score

Measures how close the privacy expectations regarding the app (as expressed by the users) are to what the app is requesting.

Satisfaction of Community's Expectations: **A+** [70%]

Privacy Friendliness: **A+** [64%]

✓ ## Privacy Friendliness Score

Takes into account privacy-related best practices, such as easy-to-understand PrP documents, associations of annotations with GDPR concepts etc.

Score	Satisfaction of Community's Expectations (%)	Privacy Friendliness (%)
A++	80 ≤ A++ ≤ 100	80 ≤ A++ ≤ 100
A+	60 ≤ A+ < 80	60 ≤ A+ < 80
A	40 < A < 60	40 < A < 60
B	20 < B ≤ 40	20 < B ≤ 40
C	0 ≤ C ≤ 20	0 ≤ C ≤ 20

THE CAP-A Reward mechanism

Combination of intrinsic and extrinsic rewards

✓ Tasks and Points

✓ User Tiers

✓ Gamification (badges, leaderboards, feedback etc.)

✓ Flexible conceptual model implemented as ontology (REWARD)

Tier	Icon	Required Points
Baby		0
Novice		100
Grown Up		300
Enthusiast		400
Warrior		1000
Expert		2000
Guru		10000
Royal		20000

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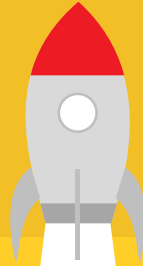
Our vision !!!

Our Vision

View privacy as a business innovation value in a new privacy-friendly market

Service Providers

Identify trends through statistics which help them invest in new apps or provide improvements on existing products

Towards

Enabling

Developers

Improve their apps based on users evaluation

Users use CAP-A tools

to evaluate the mobile apps' privacy behavior

Privacy-friendly apps market
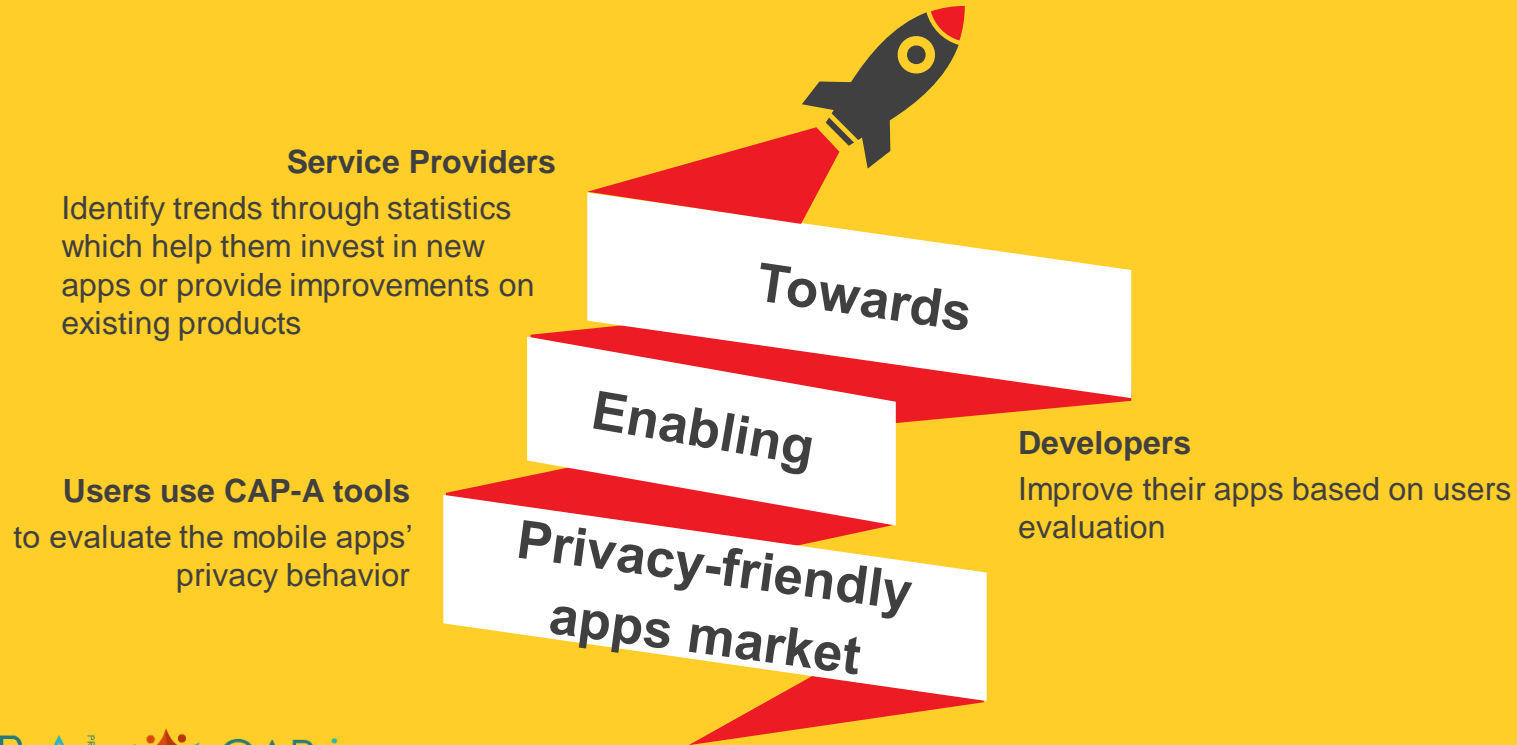
THE CAP-A TEAM

FORTH- Institute of Computer Science, FORTH- Praxi Network and IN2 Gmbh

Giorgos Flouris
Project Manager

Theodore Patkos
Scientific Coordinator

George Ioannidis
Industrial Expert

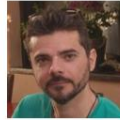**Ioannis Chrysakis**
Publicity & Engagement Manager

Alexandru Stan
Technical Manager

Elias Tzortzakakis
Lead Backend Developer
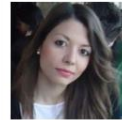
Giorgos Samaritakis
Lead Frontend Developer

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User Enactment Manager

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Exploitation Manager

Yannis Rousakis
Backend Developer

Nikoleta Tsampanaki
Frontend Developer

Elisjana Ymeralli
Backend Developer

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Marketing Consultant

Vasilis Stamatopoulos
Technology Transfer Consultant

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REFERENCES

- **The CAPrice Community**: https://www.caprice-community.net
- **The CAP-A project**: https://www.cap-a.eu

- **Publications:**
  - Chrysakis, I., Flouris, G., Ioannidis, G., Makridaki, M., Patkos, T., Roussakis, Y., Samaritakis, G., Stan, A., Tsampanaki, N., Tzortzakakis, E., Ymeralli., E.: CAP-A: a Suite of Tools for Data Privacy Evaluation of Mobile Applications. In the 32rd International Conference on Legal Knowledge and Information Systems (JURIX 2020), Demo session, 2020
  - Chrysakis, I., Flouris, G., Ioannidis, G., Makridaki, M., Patkos, T., Roussakis, Y., Samaritakis, G., Stan, A., Tsampanaki., N., Tzortzakakis, E., Ymeralli., E.: Evaluating the data privacy of mobile applications through crowdsourcing. In the 32rd International Conference on Legal Knowledge and Information Systems (JURIX 2020), 2020
  - Chrysakis, I., Flouris, G., Patkos, T., Dimou, A., & Verborgh, R. REWARD: Ontology for reward schemes. In 17th Extended Semantic Web Conference(pp. 56-60), Posters and Demos, Springer, Cham, 2020.
  - Flouris, G., Patkos, T., Chrysakis, I., Konstantinou, I., Nikolov, N., Papadakos, P., & Zeginis, C. Towards a collective awareness platform for privacy concerns and expectations. In *OTM Confederated International Conferences" On the Move to Meaningful Internet Systems"* (pp. 135-152). Springer, 2018

Hands on Agenda

1

CAP-A Portal Demo

A virtual tour of basic functionalities

2

CAP-A Live!

Live evaluation of apps through CAP-A portal and CAP-A app

3

Feedback Time / Movie Time

Users experience feedback and movie time

4

Results and Open Discussion

Live evaluation of apps- CAP-A feedback from users

CAP-A virtual tour

1. How to register and Login
2. How to earn your first 100 points
3. A basic virtual tour based on menu
4. CAP-A actions
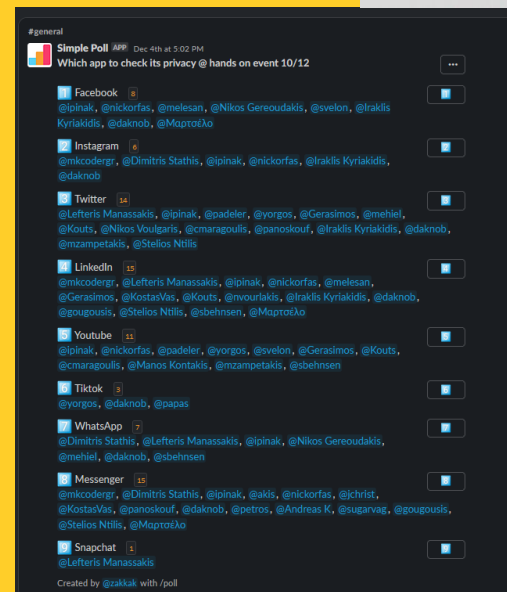5. CAP-A app and audit my apps

Hands on time!

Apps->Devstaff (available through CAP-A portal menu)

Apps (based on devstaff's slack poll)
- LinkedIn
- Twitter
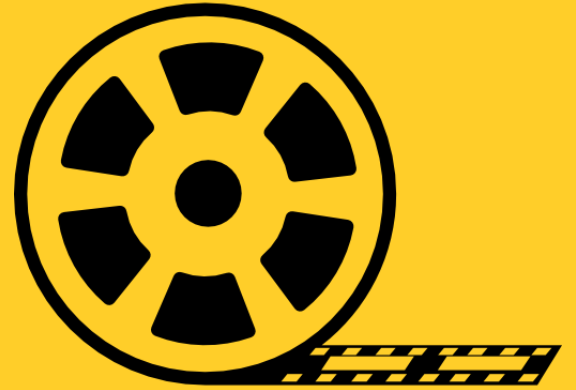- Messenger
- Youtube

- Viber
- Signal

Feedback Time!

Please **"Click here to give us your feedback"** that appears in the URL:
https://cap-a.eu/devstaff-feedback/

- All responses are anonymous

- We really appreciate your input

- Don't forget to enter your CAP-A username in order to be included in the lottery for winning an Amazon Gift Card.
  - The winner will be determined randomly via random.org and will be announced on https://www.cap-a.eu on 11/12/2020
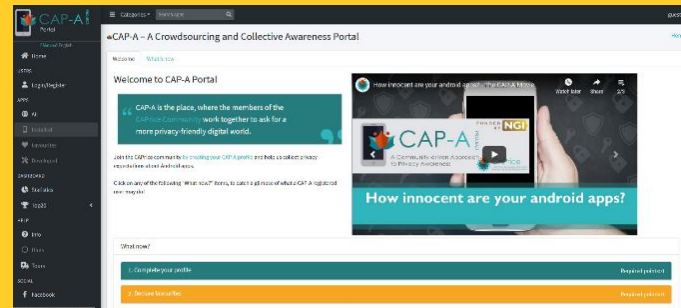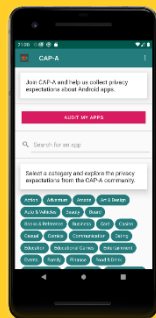
WE WANT YOUR FEEDBACK

Movie Time

- https://www.cap-a.eu/better-privacy

- https://www.caprice-community.net/idea

Feedback Results

JOIN CAP-A & CAPrice Community

✓ Use now the **CAP-A Portal** :
www.cap-a.eu/portal

✓ Use the **CAP-A app** to monitor your
installed apps (available @ play store)

YOUR OPINION COUNTS

THANK YOU!

#CapriceCommunity

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