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CAPrice

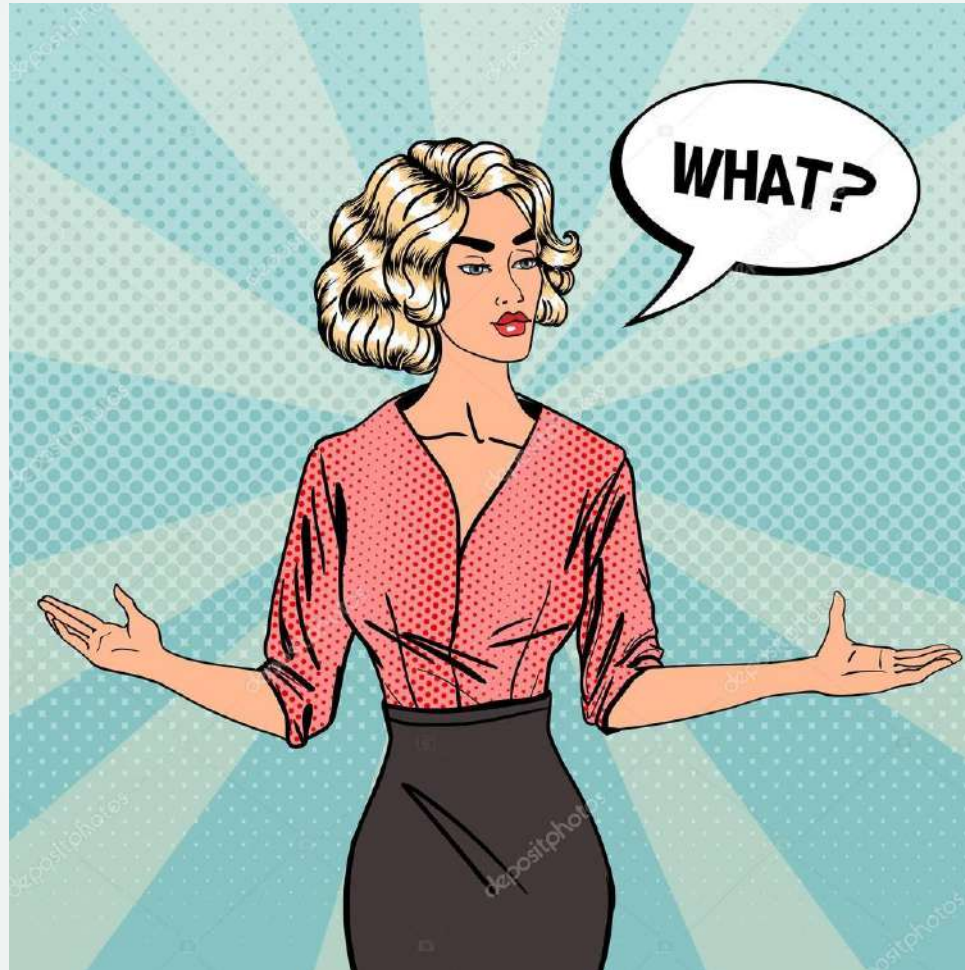
collective awareness platform for
privacy concerns and expectations

The CAPrice Initiative: A socio-technical solution to digital privacy

Speaker: Ioannis Chrysakis (FORTH-ICS) – www.chrysakis.eu

01/12/2018, 6th Google GDG Dev Fest Greece 2018, Heraklion

What do you think when you hear the word...



SMART



The digital age: The SMART present and the future



Smartphones and apps



Smart home



Smart toys




Smart Cities



Connected Cars

The power of data

- The “big data” era
 - Lots of data**, and the ability to process them
 - Machine learning, deep learning, data science
 - Hidden correlations**
 - Predict epidemics, personalized medicine, ...
 - But also personality identification, identifying habits and personal preferences, vote manipulation, ...
- 
- A word cloud graphic located in the top right corner of the slide. The words are arranged in a dense, overlapping cluster. The most prominent words, shown in larger fonts, include "BIG DATA", "STORAGE", "SETS", "DEVELOPMENT", "TECHNOLOGY", "FUTURE", "NEW", "SCIENCE", "MILLION", "ANALYSIS", "PROCESSING", "CAPABILITY", "INFORMATION", "EXTRACTED", "ANALYZED", "PREDICTED", "PERSONALIZED", "HABITS", "PREFERENCES", "MANIPULATION", "EPIDEMICS", "MEDICINE". The colors used for the words are primarily blue, green, and yellow.



- ❑ **Bloomberg:** smart meters can profile homes and habits, including what you watch on TV (via device profiling of energy consumption).
- ❑ **Personality Identification:** online services can analyze your personality based on authored text.
- ❑ **ApplyMagicSauge:** can tell your personality from facebook/twitter posts.
- ❑ **Vote Manipulation:** allegations that Cambridge Analytica and other big data companies used targeted micro-advertising and personalized emotional triggers to help in the success of the Brexit and Trump campaigns.

Smart Devices and Privacy

- Smart devices are everywhere...
- However, consumers generally **unaware** of the data being accessed and/or transmitted by their devices¹

The Wall Street Journal: the examination of 101 popular smartphone apps revealed that:

- ☐ 56 apps transmitted the phone's unique device ID to other companies without users' awareness or consent.
- ☐ 47 apps transmitted the phone's location in some way.
- ☐ 5 sent age, gender and other personal details to outsiders.

Terms of Service (ToS)

- **ToS documents**
 - Lengthy¹
 - Hard to read/understand
 - Change often
- **Real versus digital world**
 - Different behaviour with regards to privacy^{2,3}

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Print Next Cancel

- ❑ **1. NCC** : Reading ToS for an average Norwegian would take 32 hours (250.000 words)
- ❑ **2. Purple**: 22.000 users agreed to 1.000 hours of community service (including cleaning animal waste and relieving sewer blockages) in exchange for free wifi
- ❑ **3. Video**: If your shop assistant was an app (hidden camera) @ youtube

Our Goal

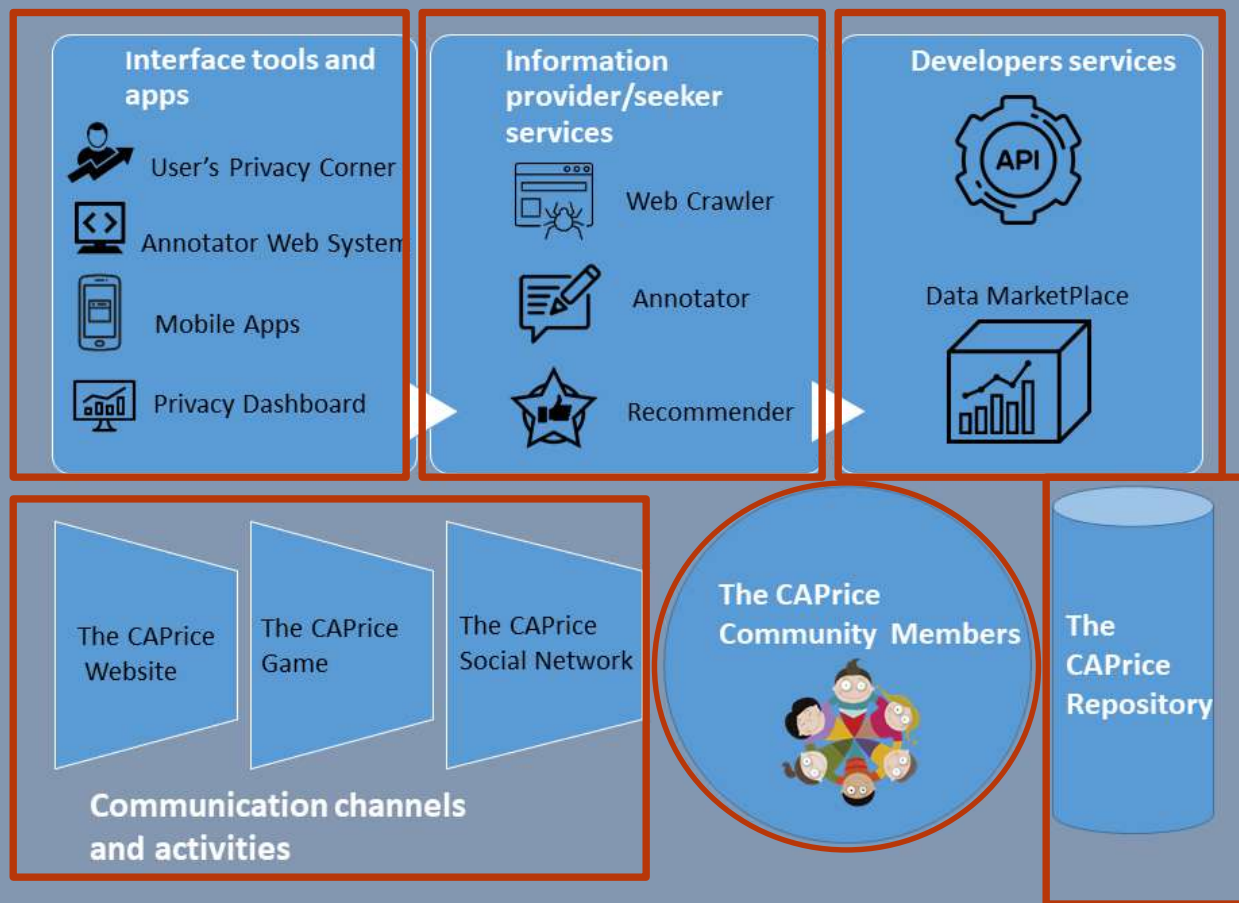
- How do we enable **users** to:
 - understand and be aware of what they gain and what they lose when they use digital services?
 - decide collectively and make explicit their privacy preferences.
- How can we convince **developers** that respecting users' privacy is profit-maximizing?
- Create a **trusted-market** where we can bring together users, hackers and developers.

Our Plan

- **1.Awareness:** By this way people could understand the problem and start considering solutions.
- **2. Action:** Participating in the collaborative process of annotating ToS documents, stating privacy concerns, creating and configuring collective privacy norms etc.
- **3. Crowdsourced activities:** Tools and services that allow users to finally create more digital more privacy-friendly products and services.



Our Solution



Tools and Services (1/2)

The screenshot shows the CAPrice Privacy Dashboard for the WhatsApp Messenger application. The dashboard is divided into several sections:

- Application Details:** Displays the WhatsApp logo, name, developer (WhatsApp Inc.), category (Communication), and Play Store Rating (4.4 stars).
- Privacy Conscious Behaviour:** Shows a 'Trusted 85%' status with a green shield icon.
- Navigation Tabs:** Includes 'Details', 'Permissions', 'Suggested Applications', and 'Community Review' (which is currently selected).
- Community Review Section:**
 - Application has access to:** Lists permissions like 'Device and History', 'Contacts', and 'Location'.
 - Purpose (Developer):** Shows 'mandatory' for Device and History, and 'quality services' for Location.
 - Mockery Evidence:** Displays evidence from other users, such as '89% choose' for Device and History, and '67% choose' for Contacts.
 - All User's Opinion:** Shows a '90% choose' for Location.
 - Statistics:** Provides a visual representation of the user's opinion.
- Buttons:** Includes 'What's your opinion?' and 'Cancel'.

Privacy Dashboard: Understanding apps' behaviour

The screenshot shows the CAPrice User's Privacy Corner, which allows users to manage their permissions for various applications. The interface includes:

- Navigation Menu:** Includes 'Dashboard', 'My Applications', 'Explore', and 'Permissions'.
- Edit your Permissions:** A list of permissions with toggle switches:
 - Identity: ☒
 - Contacts: ☐
 - Location: ☒
 - SMS: ☒
 - Phone: ☐
 - Photos/Media/Files: ☒
 - Microphone: ☒
 - Device & App history: ☐
- Buttons:** Includes 'Cancel' and 'Apply'.

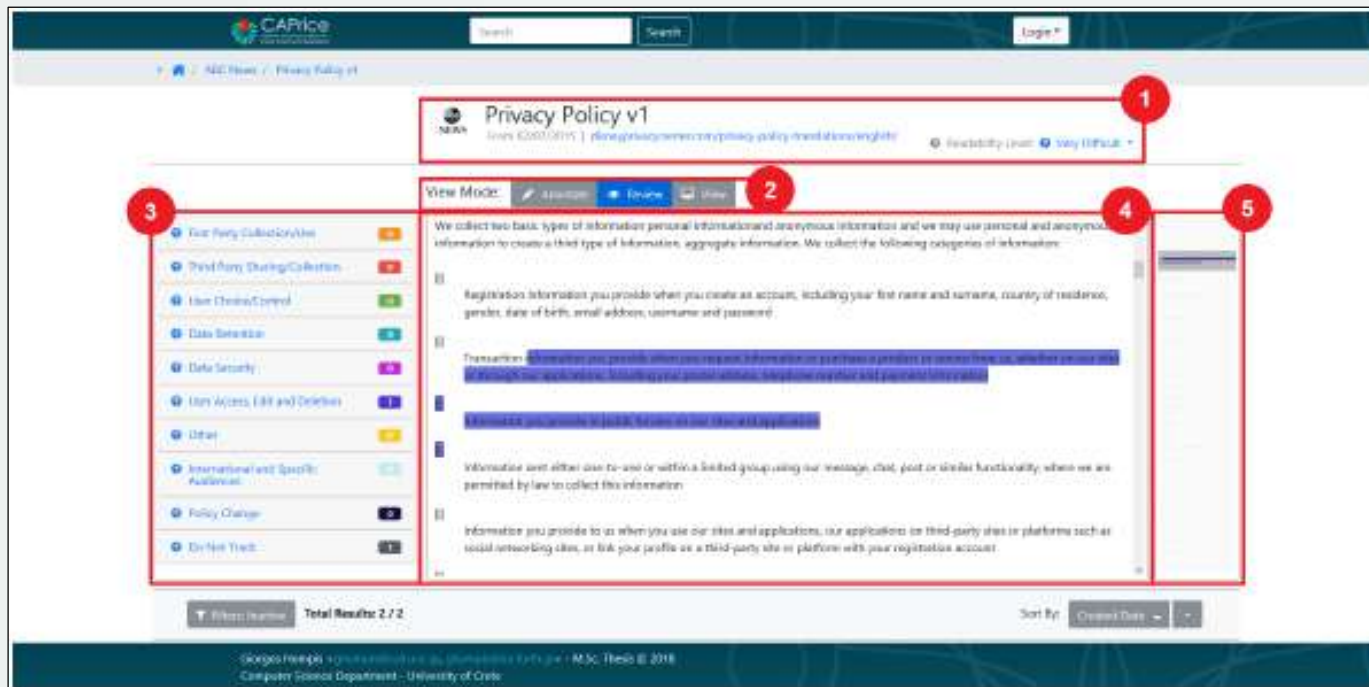
User's Privacy Corner

The screenshot shows the CAPrice Community Review section for the application 'Alpha' von Sonderspiele. The interface includes:

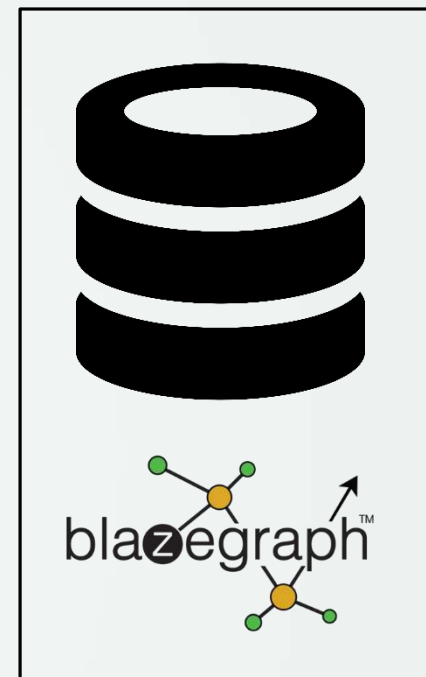
- Application Details:** Displays the app icon, name, category (Casino), and rating (4.35).
- Navigation Tabs:** Includes 'GENERAL', 'PERMISSIONS', 'SUGGESTED APPLICATION', and 'COMMUNITY REVIEW' (which is currently selected).
- Community Review Content:**
 - MSE: Infinity:** A section for user feedback.
 - Application wants access to:** A section for user feedback.
 - Have you noticed something different ?** A section for user feedback.
 - Inform the Community:** A button to submit feedback.
 - ADD EVIDENCE:** A button to add evidence.
 - Users have found the following Evidences:** A section for user feedback.

Community Review

Tools and Services (2/2)







ToS Annotator



CAPrice Repository

Communication Channels

- Our website:
 www.caprice-community.net
- Social Network (#CapriceCommunity)
 -  Facebook: www.fb.com/CapriceCommunity
 -  Twitter ([@CapriceSociety](https://twitter.com/CapriceSociety))
 -  Youtube ([CAPrice Community](https://www.youtube.com/CAPriceCommunity))
- Gamification Activities
 -  The CAPrice Game: <https://www.caprice-community.net/game>

The CAPrice Game - Level 0

- A mobile game based on famous android apps and their respective permissions as appeared in Google Play Store.



- But before start playing let's talk about apps and permissions...

App Permissions

access USB storage filesystem
 read calendar events plus confidential information
 read call log
 read phone status and identity (in 2 Groups)
 read sensitive log data
 read the contents of your USB storage (in 2 Groups)
 read your contacts
 read your own contact card
 read your text messages (SMS or MMS)
 read your Web bookmarks and history
 view Wi-Fi connections
 retrieve running apps
 find accounts on the device (in 2 Groups)
 body sensors (like heart rate monitors)
 approximate location (network-based)
 precise location (GPS and network-based)



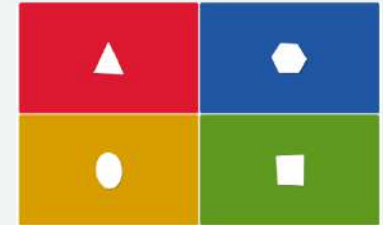
add or modify calendar events and send email to guests without owners' knowledge
 add or remove accounts
 modify or delete the contents of your USB storage (in 2 Groups)
 modify your contacts
 write call log
 edit your text messages (SMS or MMS)
 reroute outgoing calls
 directly call phone numbers
 receive text messages (SMS)
 send SMS messages
 take pictures and videos
 record audio



The CAPrice Game



Let's Play



- From your mobile device go to kahoot.it
- Enter the requested PIN
- Enter your alias and get ready!

Rules:

- *Each question has exactly **one correct answer***
- *For each question you select a **color** that corresponds to only one answer.*
- *The **fastest** and the most **correct** 3 players will be awarded.*
- ***Tip:** You get extra points if you give **sequential correct answers**.*

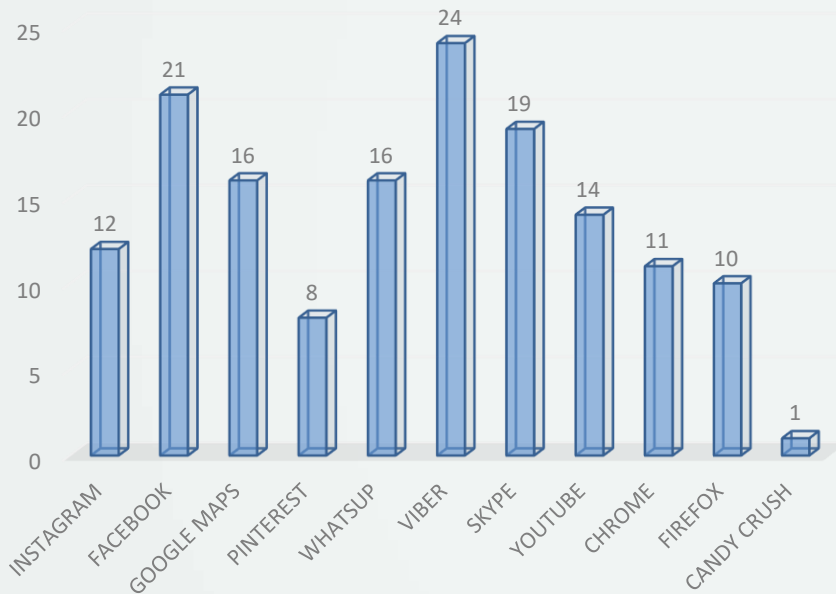
Time for Discussion

- How do you find the results of the CAPrice Game ?

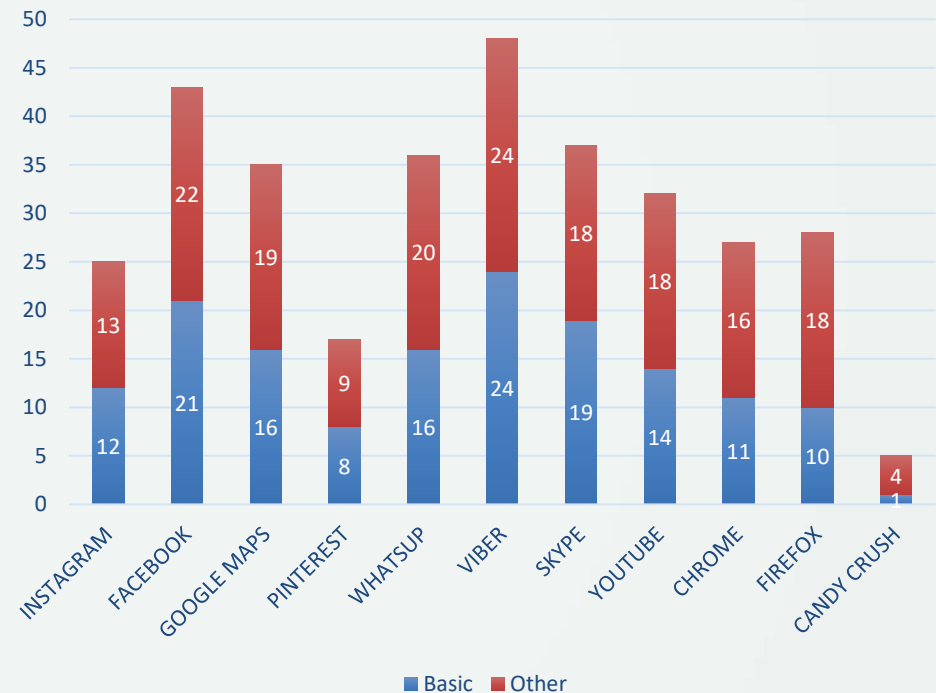


Android apps and permissions

Basic permissions (Max 28)



Basic + Other permissions



Time for action

- Be part of the solution by joining in the **CAPrice Community**
 - Via **website** [caprice-community.net]
 - Giving feedback, voting, etc
 - <https://www.caprice-community.net/feedback/>
 - Learn about actual cases of privacy threats
 - Discover cutting edge technical solutions
 - Via **e-mail**:
 - <https://www.caprice-community.net/get-involved/>
 - Via **social media**   



References

- The **CAPrice** promotional **video**:
 - <https://youtu.be/4L8gOfU9MXg>
- **If your shop assistant was an app** (hidden camera):
 - <https://youtu.be/xYZtHIPktQg>
- The **#toyfail** case
 - <https://youtu.be/lAOj0H5c6Yc>
- How long does it take to read **Amazon Kindle's** terms and conditions?
 - <https://youtu.be/sxygkyskucA>
- **Conference Paper** [CoopIS 2018]
 - *Giorgos Flouris, Theodore Patkos, Ioannis Chrysakis, Ioulia Konstantinou, Nikolay Nikolov, Panagiotis Papadakos, Jeremy Pitt, Dumitru Roman, Alexander Stan, Chrysostomos Zeginis: Towards A Collective Awareness Platform for Privacy Concerns and Expectations.*

Thank you for your attention



Ioannis Chrysakis



Dimitris Plexousakis



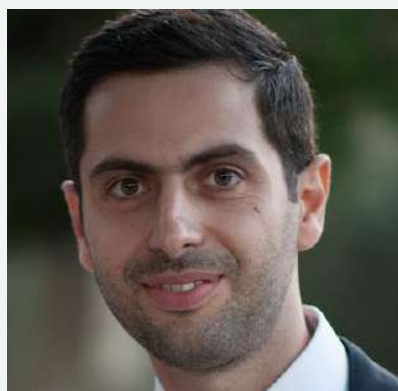
Giorgos Flouris



Theodore Patkos



Konstantinos Kreatsoulas



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