

# CAP-A: A Community-driven Approach to Privacy Awareness

## Summary

Solid legal regulations and technical countermeasures are not always sufficient to achieve society-wide impact on privacy protection; data protection can also be powered by the society itself.

The CAP-A project is offering socio-technical tools to promote collective awareness and informed consent, whereby data collection and use by digital products are driven by the expectations and needs of the consumers. Theme-driven events aimed at rating the privacy friendliness of apps of specific categories and at annotating their Privacy Policy documents have helped us generate informative statistics about the behaviour and mindset of citizens and the privacy-consciousness of mobile apps.

## Keywords

Collective Awareness, Mobile Apps, Privacy Expectations, Privacy Norms, Privacy Policy Annotations.

## Actors involved in the project

CAP-A is run by two partners (see <https://cap-a.eu/>), namely the Foundation for Research and Technology – Hellas (FORTH) and IN2.

[FORTH](#) coordinates the project and participates with the [Institute of Computer Science \(ICS\)](#) and the [PRAXI Network](#). [IN2 Digital Innovations](#), is a software development company offering web-based solutions.

## Contact Persons

Theodore Patkos – [patkos@ics.forth.gr](mailto:patkos@ics.forth.gr)  
Giorgos Flouris – [fgeo@ics.forth.gr](mailto:fgeo@ics.forth.gr)  
Ioannis Chrysakis - [hrysakis@ics.forth.gr](mailto:hrysakis@ics.forth.gr)  
Alexandru Stan - [as@in-two.com](mailto:as@in-two.com)

## The business

Privacy and anonymity in the digital world are becoming increasingly difficult to achieve. While we recognise the dramatic progress brought about by Information and Communication Technology (ICT) in almost every aspect of our everyday life, we realise that, in the process, we handed over privacy management to businesses and corporations that are primarily driven by a profit motive, making our personal data vulnerable to exploitation in ways that are harmful to us. As ICT scientists and as citizens of the digital world, this situation has been causing us a growing feeling of discomfort.

Four years ago, we decided to take some action. Driven by FORTH-ICS and supported by IN2 and a number of other academic and industrial entities, as well as individuals, we launched the [CAPrice initiative](#), a grassroots community with the goal of applying crowdsourcing solutions to raise awareness and provide solutions to privacy-related matters. The CAP-A project is part of this initiative.

FORTH (Greece) is the largest research centre of Greece. FORTH-ICS has a long track record in conducting basic and applied research, occupying a full-time staff of over 350 people. FORTH also involved the PRAXI Network in the CAP-A project, a distinct administrative unit operating within FORTH, and an established technology transfer organization.

IN2 (Germany) provides extensive experience in applied research and innovation, building cutting-edge webware and scalable solutions for the Web.

## The problem

Society in general acknowledges that privacy preservation is essential in human relations, democracy, independence, and reputation. Yet, for various reasons, the more pronounced being limited awareness of the involved risks, we tolerate untrustworthy software to collect, store and process our data, having limited or no evidence as to how this sensitive information will be protected, who has access to it, or even what the intended purpose is.

The need to forge sound laws to regulate business policies for data protection is judged necessary; but, unfortunately, solid legal regulations are not always fully capable of accomplishing a paradigm shift. The ease with which we give our consent to the processing of our data not only hinders the efficacy of legal regulations, but also makes it difficult for technical countermeasures to achieve a broad impact on privacy protection.

We therefore proposed to NGI\_Trust the CAP-A project, at the heart of which is the hypothesis that data protection can also be powered by the society itself. By mobilising consumers to become active players in digital marketplaces and by developing tools to harness our collective power, the adoption of the technical and regulatory frameworks can become more effective and ubiquitous, and the market will act with responsiveness, mostly because it is profit-maximizing.

CAP-A is offering socio-technical tools to promote collective awareness and informed consent, whereby data collection and use by digital products are driven by the expectations and needs of the consumers themselves. Apparently, the biggest challenge faced when putting community-driven efforts to action is to engage a wide and diverse audience, and at the same time to stimulate the participation of various stakeholders in

the process. As a result, our team devoted equal effort both to the technical and to the societal aspect of developing the CAP-A solution.

## The solution

CAP-A began in August 2019 and was planned to run for one year; however, due to the COVID-19 pandemic, an extension until the end of 2020 was granted. The goal of the project was from the beginning threefold.

First, we developed a **suite of ICT tools** to facilitate the participation of users in accomplishing tasks related to privacy aspects of mobile apps. The [CAP-A portal](#) and the [CAP-A mobile app](#) encapsulate, among others, services for app search and rating, Privacy Policy annotation, community analytics and a news corner. The portal provides the means to generate useful privacy-related content for all members of the community. The CAP-A tools were implemented using open-source technologies, such as Virtuoso for the global repository, JAVA and REST for the web services and Swagger for testing and documentation.

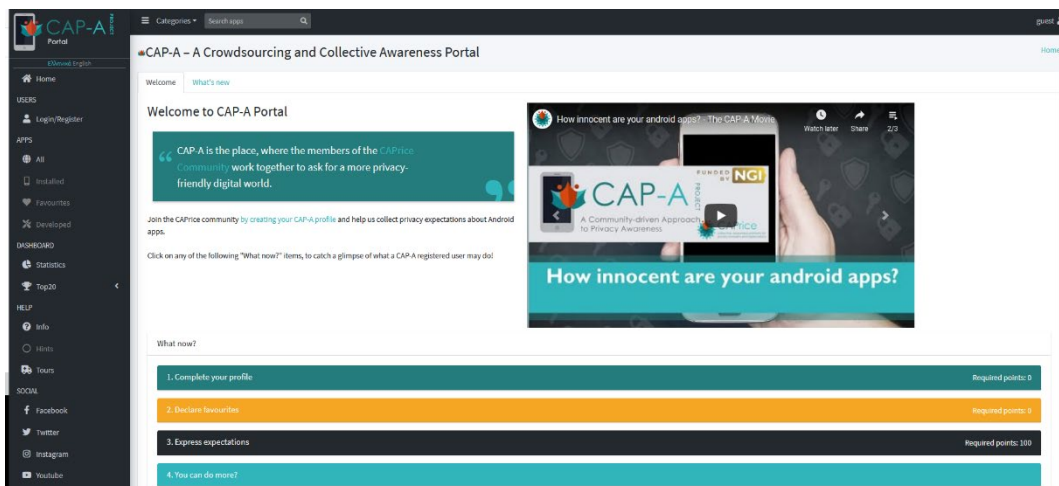


Figure 1. The CAP-A Portal

Second, we designed and implemented a **gamification/rewarding strategy** to increase user engagement and to motivate participation and contribution. Building and sustaining a community is a key success factor of any crowdsourcing solution. We therefore enacted a strategy that rewards the time and effort contributed, which is tailored to the ICT tools developed and fun to experience.

Finally, we organized **pilots** in the form of **thematic events**. In collaboration with external collaborators, we launched 6 events, where users could express their opinion about apps of specific categories, such as game apps, social media apps, conferencing apps etc. The focus of our campaign targeted primarily simple users, but we also ran pilots for legal experts, as well as with app developers, in order to attract the participation of various stakeholders. Among similar projects, CAP-A is probably the first effort to truly mobilise community action on such a scale, by applying both aggregation and co-creation actions.

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

Figure 2. CAP-A Tiers

Throughout the project, the CAP-A team considered various potential business models. We concluded that the establishment of a separate legal entity (NGO) with a dedicated social profile can incorporate several possibilities for revenue generation (licensing and cooperation agreements, advertising, consultancy and training, data analytics provisions, public grants and private donations). It will also better serve the principles and concepts of the CAPrice initiative.



Figure 3. The CAP-A Solution

## Results

The CAP-A portal digested privacy-related information about more than 19K Android apps, which is available for users to explore. During the project, 164 users registered and used the CAP-A portal, whereas 51 users installed the mobile app. Their contributions resulted in the expression of personal expectations for about 567 apps and in 1181 annotations on different Privacy Policy documents.

Beyond the portal and the project website, our communication and dissemination activity reached 253516 Facebook users and 34468 Instagram users, while our official twitter account made 104.3K impressions. It also helped grow the CAPrice Community, namely the mailing list by 240% (currently 455 users) and the total community size, including social media followers, by 142% (currently 1555 users/followers/subscribers). Moreover, we presented the CAP-A project in 7 scientific venues and 12 wide public events.

Considering the above, one of the main objectives set in the beginning of the project, i.e., to attract the interest of a considerable number of users to start generating informative privacy norms, has been achieved. The CAP-A dashboard provides a wealth of statistics, as for example the percentage of citizens who found reasonable to give access to a certain type of data, such as camera or contacts, for a given app category. This information can be used by different stakeholders (developers, social scientists, policy makers) to conduct analyses and interpret the behaviour and mindset of various user groups, according to age or other demographic characteristics.

The CAPPrice community is not a sizable virtual community yet; the biggest challenge is to achieve the critical mass needed to make the community self-sustainable. Already the experience gained during the course of the CAP-A project led us to improve and adapt our user enactment strategy at various levels.

## Testimonial

The idea behind CAP-A existed long before we became aware of the funding opportunities offered by the NGI\_Trust project. As the expected impact and objectives of the call matched perfectly with our objectives, we decided to apply.

This turned out to be a very good decision, as our overall experience from the cascade funding mechanism and collaboration with the NGI\_Trust project is judged very satisfactory. The short period between proposal submission and beginning the actual work, the clear requirements, and the swift management of the administrative procedures helped us focus on the important aspects. In addition, the frequent -yet not overwhelming- communication with the NGI\_Trust coordinators and our mentors (coaches) created a feeling of teamwork.

During the course of the project, we participated in the “NGI\_Trust business mentoring and IPR support” webinar, followed by a series of one-to-one sessions with the organizer, Unai Calvar Aranburu. The outcome of these communications was helpful and positive. We also valued as really important the networking sessions that NGI is constantly organising. It enables us to meet the people behind the NGI Initiative, as well as members of other third-party projects, people with whom we share common ideas regarding privacy and trust in the Internet.

Mentoring was provided by two coaches, namely Colin Wallis and Alejandra Ruiz, the collaboration with whom was seamless and warm, and was based on mutual respect. In all 3 virtual meetings that we had, the coaches confirmed the good state of the project and gave us useful feedback and comments for further improving our work. Moreover, we engaged the coaches in several important decisions and looked for their advice and feedback in critical deliverables. Mentoring was initially perceived by the project members as a way to ensure the good state of CAP-A and its smooth running at specific checkpoints (similar to project reviews in EU projects). However, mentoring turned out to be much more than that, as the coaches' feedback helped steer the project towards its successful completion and was valuable in more ways than just as a reviewing mechanism.

## Future plans

The CAP-A project is part of/and predated by the CAPPrice initiative. Through CAPPrice, the outcomes of the project will be maintained in the future. However, to fund additional development and feature improvements, other sources of income should be considered. Towards this aim, we will employ in parallel two complementary approaches.

The first is to pursue the chosen exploitation path for the CAP-A project, which consists in the establishment of a Non-Profit Organisation (NPO), acting as an umbrella that will

incorporate additional identified possibilities for revenue generation. The generated income will be leveraged for further investments that will enlarge the scope of the CAP-A tools and CAPrice initiative and will support future development. A further exploitation opportunity (that could be served through the NPO as well) is the idea of selling licenses to specific stakeholders, in order to use certain parts of the database or to open up part of the data through an API for providing added-value services over CAP-A.

The second approach consists in seeking additional funding for some follow-up project. Towards this, we are considering various calls, both national and European, including other cascading funding opportunities within NGI.