ICT - Information and Communication Technologies
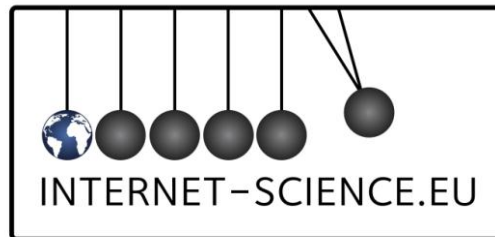
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1   Executive Summary

This document encompasses research activity for an evolving interdisciplinary understanding of Collective Awareness Platforms between the research team members. D1 incorporates different dimensions of (viewpoints to) collective awareness, including the market-, socio-psychological, and cognitive ones to a generic characterization of CAPs in terms of attributes such as structure, incentives, purpose, privacy issues, and reliability. Indeed, it precedes the related activity under D2 ("Collective Awareness Platforms: Privacy, incentives, and market dimensions") which explicates these dimensions. Within the activity under D1, 68 instances of CAPs were preliminarily analyzed and, based on that, a survey was developed that is currently administered to CAPs coordinators to detect the perceived importance of other relevant dimensions such as topic, cost, payoff, privacy, reputation and community structure.

2 Introduction

The Collective Awareness Platforms for Sustainability and Social Innovation (CAPs) include all those applications based on Internet or mobile communication that exploit social networking for creating communities, deliver new services, building innovative knowledge, exploiting and promoting collective intelligence. The final goal of CAPS is that of (directly or indirectly) promoting a more sustainable lifestyle and promote social changes, beyond the standard market model.

There are many examples of distributed platforms based on some form of collective intelligence, sometimes involuntarily contributed. Some of them are "big" platforms like Google, Wikipedia or Facebook, but there is also a myriad of small free applications for web or mobile phones. The goals of these platforms range from some innovative version of the profit model (Google, Facebook), while others (like Wikipedia, but also the Linux development) rely on different motivational elements. Indeed, many social innovations have originated as CAPs in recent years, and with the pervasiveness of the Internet of Things (sensors and tags embedded in every item in use) many more applications will arise.

CAPs are currently viewed as a promising vehicle for unlocking the tremendous potential that technology-enabled, highly-connected, distributed and participatory human beings can bring about for the benefit of Society and the environment. However, CAPs largely rely on the collaboration and contributions of human beings with very different personality attributes, cognitive strategies, and varying exposure and sensitiveness to social influence. Their behaviors combine in different proportions (pure) altruism and rational selfishness (i.e., economic man), exhibit psychological and cognitive biases, and are shaped by the real and virtual communities they participate in. Moreover, many CAP instances need to overcome the concerns of end users about the privacy of their data and locations; again, the intensity of these concerns varies broadly across the (candidate) contributors. Last, but not least, CAPs usually represent a paradigm of service provision that deviates from familiar rules and prescriptions of market, and may stand competitively against purely commercial alternatives. For all these reasons, their wide adoption, sustainability, and effectiveness present major challenges.

Most of CAPs are not driven by profit, and this represents the modern incarnation of the free software movement, to be compared with the traditional market-driven approach. For many applications of this type, the social acceptance (e.g., number of users, their activity) is the crucial factor that discriminates thriving from dying. This does not imply that the market dimension is not important: Google owes its fortune to the mass of users that contribute (informed or not) with a piece of knowledge either by adding a link to a web page (e.g., page rank), or by clicking a search topic, or sending emails using Gmail, etc.. A similar analysis applies to Facebook. The European Union is supporting CAPs as an instrument for sustainability and social innovation [1]. Unlike the US scenario mainly funded by charitable and profitable investments, EU research is publicly funded.

CAPs embody one of the possible directions that the future Internet evolution may take, strongly promoting collaboration and social values, as opposed to more individualist approaches that envision the Internet as (yet another) field of commercial competition. However, many problems in CAPs development stem from the fact that their design is mainly driven by technology and not the knowledge of computer-

mediated human communications and reactions. Examples of such problems are the phenomena of many CAPs which can in principle meet common needs, be developed but never actually adopted or other applications that need to overcome the concerns of end users (candidate contributors) about the privacy of their data and locations. Understanding the mechanisms that engage humans into active contribution and sharing of knowledge, can support reactions to address these problems.

One of the main challenges that arise in this direction amounts to classifying CAPs using a small number of relevant axes and exploring the interaction among CAPs and users in order to develop a predictive tool that would allow the monitoring of the "healthy status" of the application and of its reference community, eventually furnishing assessment indicators. The principal ingredient of this modeling is clearly the human factor operating as individual, in community and in society. In the sequel, we start with related research efforts in classification of online virtual communities in Section 3. We then provide an introductory analysis of fundamental features of 68 CAPs instances in Section 4 and a preliminary survey currently administered to CAPs coordinators in Section 5. In Section 6, we present an abstract architecture model of the human cognitive activity that will allow for modeling the key components that are distinctly influenced by the collective awareness enabled by emerging CAPs environments. This deliverable focuses on activity under T1.1 ("Characterization/typologies of CAPs"). "). The investigation over the classification of CAPs is a joint effort with the EU project Scicafe2.0, which is a coordination action aiming at porting collaborative techniques from the experience of science cafés into Internet, and setting up an observatory on crowdsourcing.

3   Related aspects in CAPs characterization

An abstract classification of CAPs is originally presented in the technical notes of Sestini [1], where the concept of the collective awareness platforms is described. The work emphasizes the importance of platforms' goals. The possible missions of the platforms are supposed to go beyond the abstraction of the create-decide tuple. Increasing self-conscience, nudging towards environmental-friendly lifestyles, enhancing democracy, and taming of complex scientific tasks are identified as broad classifiers of CAPs at the mission level.

In [2], CAPs are described in the term of web-enabled Collective Intelligence (CI). In particular, they draw on a study of 250 examples of web-enabled CI, carried out in the context of a broader initiative on collective intelligence at MIT. Four fundamental attributes are proposed for abstracting all such applications, as well as their values: their goal (create a utility or inform decision-making), their incentives (money or love/glory), their staffing (crowd or some hierarchical structure), and their procedural operation, which depends on their goal. Hence, when creation is involved, the goal may involve simple collection or tighter collaboration and synchronization of individual contributions; whereas, when CI applications enable decision-making, the decisions may be taken by individuals or only at group-level, and involve monetary or non-monetary incentives. The authors acknowledge that this categorization "provides a useful start for the much-to-be-done work".

Online collective systems are also considered by Antin [3]. The focus is on the operational aspects of online collaborative systems, and the desired mode of end user contributions to each one of them. Hence, there are systems where the diversity matters more than the size of the contribution. Furthermore, in some instances it is critical to indicate individuals' membership to a contribution group, irrespective of their actual contribution to the system. Contrary to other works, Antin is not interested in the complete taxonomy of such systems, but he rather seeks to identify which social-psychological incentives may apply to each contribution mode, drawing hints for the design of a related user interface.

4 A preliminary analysis of CAPs: Identification of the relevant dimensions

4.1 Introduction

Collective Awareness Platforms are currently considered as important crowdsourcing instruments that may promote cooperation and participation in virtuous behavior in the field of social life, energy, sustainable environment, health, transportation, etc.. In general, CAPs do not obey the usual market dynamics: they may be developed by volunteers or publicly funded (e.g., EU projects). Typically, people's participation in CAPs is not always triggered by an immediate return. Several motivations may co-operate as described in the sequel. Their analysis may prevent the failure of CAPs and the associated, evident waste of effort and funding.

The core of our investigation is that of developing a model for CAPs' individual users that accounts for what is known as human behavior - rationality: human heuristics, emotional components, peer and group influence. The resulting model will be used as the elementary constituent of a theory that will draw on game-theoretic principles, in order to support the identification of factors that cause the success or failure of CAPs. In particular, we shall analyze the role of payoff (which is in general non-linear in terms of the number of participants), incentives, motivations (reputation, emotional components) and community structure.

In this respect, we start with an introductory analysis of CAPs, based exclusively on the analysis of documents found on the Internet. In the second phase of our work, we present the design of a questionnaire, based on data collected during the first phase of the investigation, which has been sent to coordinators of CAPs. The goal of this preliminary investigation is that of identifying the relevant dimensions to be addressed by a direct questionnaire in a *quantitative* way. We need to identify which quantities can be expressed using a Likert scale or multi-choice answers.

The main points/factors/dimensions that are critical to our investigation are:

- The subject of the action of the CAP: which field/problem/need this platform is addressing.

- The health state of the CAP: is it alive, dead, completed or failed?

- Number of participants, kind of community/group/hierarchical structure that the CAP is building.

- Messages and communications among participants, communication network.

- The kind of payoff the CAP is offering to participant: which is the expected direct benefit? How does this benefit depend on the number of participants and their group structure? Is it a majority game (in which the payoff increases with the number of participants) or a minority one? Is there is a threshold over which the payoff decreases? Is the group/community structure important?

- Is there any other indirect benefit? Are there present incentives not directly related to the scope of the CAP?

- Is there a reputation system? Is there some kind of gamification? (Public scores, for instance).

- Emotions and sentiments involved.

4.2 CAPS Analyzed

We have analyzed 68 CAPs selected from those financed by EU in the last calls and others involved in past or on-going European projects. To support the modeling of the behavior of CAPs, the survey methodology have followed the principle of "target group-specific purposive sampling". The studied CAPs have been divided into a set of different coherent disciplines/areas. In the following report, we descriptively categorize different instances of CAPs and, when possible, we process and present the collected data in graphic forms that ease understanding and comparison between the instances.

1. **Name**: La Quadrature du Net

   website: http://www.laquadrature.net/

   Description: La Quadrature du Net is a non-profit association defending the rights and freedoms of citizens on the Internet. More specifically, it advocates for the adaptation of French and European legislation to respect the founding principles of the Internet, most notably the free circulation of knowledge. As such, La Quadrature du Net engages in public-policy debates concerning, for instance, freedom of expression, copyright, regulation of telecommunications and online privacy.

   In addition to its advocacy work, the group also aims to foster a better understanding of legislative processes among citizens. Through specific and pertinent information and tools, La Quadrature du Net hopes to encourage citizens' participation in the public debate on rights and freedoms in the digital age.

2. **Name**: 2050 Pathway simulator

   website: http://2050-calculator-tool.decc.gov.uk/

   Description: The UK is committed to reducing its greenhouse gas emissions (GHG) by at least 80% by 2050, relative to 1990 levels. For this to happen, the UK economy must be transformed while ensuring secure, low carbon energy supplies to 2050. The 2050 Calculator is a user-friendly model that lets people create own UK emissions reduction pathway, and see the impact using real UK data. The Calculator helps everyone engage in the debate and lets Government make sure people's planning is consistent with the long-term aim.

   The 2050 Calculator outlines, in minutes, months of work from technical experts. It can be used to engage a range of audiences on the challenges and opportunities of the energy system. It brings energy and emissions data alive, showing the benefits, costs and trade-offs of different versions of the future. It allows citizens to explore the fundamental questions of how the UK can best meet energy needs and reduce emissions.

3. **Name**: Arduino

   website: http://arduino.cc/

   Description: Arduino is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It is intended for artists, designers, hobbyists and anyone interested in creating interactive objects or environments.

4. **Name**: Avaaz

   website: http://www.avaaz.org/

   Description: Avaaz is a global web movement to bring people-powered politics to "pervasive" decision-making.

5. **Name**: BeAware

   website: http://www.energyawareness.eu/beaware/

   Description: Energy Life is a system utilising wireless sensors, and a smartphone that turns energy consumers into active players. Energy Life participants play through different levels collecting scores in savings and through advice tip reading and quizzes. Key principles embodied in Energy Life are: situated and combined feedback including knowledge and consumption information, intuitiveness and non-intrusiveness by utilizing an always at hand solution on a touch enabled smartphone, sustained interaction and engagement by using a applied game that connects players within and between households.

6. **Name**: Better Life Index

   website: http://www.oecdbetterlifeindex.org/

Description: Better Life Index is designed to let people visualise and compare some of the key factors – like education, housing, environment, etc. – that contribute to well-being in OECD countries. It is an interactive tool that allows people to see how countries perform according to the importance people give to each of 11 topics that may result in a better life.

7. **Name**: Birmingham civic dashboard

   website: http://civicdashboard.org.uk/

   Description: The Birmingham Civic Dashboard receives a report of the requests that come in from members of the public for services from Birmingham City Council each day. It then produces a number of visualisations of that data, e.g., showing them on a map.

8. **Name:** Caps2020

   website: http://caps2020.eu/

   Description: Organization of the annual "CAPS international conference" in the context of Horizon 2020.

9. **Name:** Carma

   website: https://car.ma/

   Description: Carma is the breakthrough smartphone app that lets you arrange carpools with your community and share the cost of driving. Get there together today!

   Carma's free mobile app enables private cars to become part of the public transport network by providing a marketplace for drivers to offer their unused places to other people in real time.

10. **Name**: CATALYST

    website: http://www.catalyst-project.eu/

    Description: CATALYST is an EU funded project that brings together those working in the general field of Capacity Development for Hazard Risk Reduction and Adaptation in order to identify and share information about best practices, identify knowledge gaps, and strengthen and extend existing networks.

11. **Name:** Challenge.gov

    website: https://challenge.gov/p/about

    Description: A partnership between the public and the government to solve important challenges.

    Challenge.gov is a collection of challenges and prize competitions, all of which are run by more than 50 agencies across federal government. These include technical, scientific, ideation, and creative competitions where the U.S. government seeks innovative solutions from the public, bringing the best ideas and talent together to solve mission-centric problems. Hundreds of competitions are included that cover a wide range of interests. Varying levels of skills and abilities are required in order to participate. The Search feature helps to discover inputs of interest, sort by type of challenge, prize amount, and by the agency hosting the competition.

12. **Name**: CHEST

    website: http://www.chest-project.eu/

    Description: CHEST project will contribute to analyse and test the new collective mechanisms as well as to providing ICT tool and methods for fostering grassroots social innovation at local and global scales.

13. **Name**: Code for America

    website: http://www.codeforamerica.org

    Description: Code for America is 501(c)3 non-profit that envisions a government by people, for the people, that works in the 21st century.

    Their programs change how we participate in government by:

    - connecting citizens and governments to design better services,

    - encouraging low-risk settings for innovation; and,

    - supporting a competitive civic tech marketplace.

14. **Name:** Commission on the Measurement of Economic Performance and Social Progress

    website: http://www.stiglitz-sen-fitoussi.fr/en/index.htm

    Description: Commission on the Measurement of Economic Performance and Social Progress

15. **Name**: Commotion Wireless Project

    website: https://code.commotionwireless.net (site unreachable)

    Description: Developing a secure and reliable platform to ensure that communications cannot be controlled or cut off by authoritarian regimes

16. **Name**: Communia

website: http://www.communia-project.eu/

Description: The Digital Public Domain as Foundations for an Open Culture

17. **Name**: CONSENT

    website: http://www.consent.law.muni.cz/index.php

    Description: The CONSENT project seeks to examine how consumer behaviour, and commercial practices are changing the role of consent in the processing of personal data. While consumer consent is a fundamental value on which the European market economy is based, the way consumer consent is obtained is questionable in popular user-generative/user-generated (UGC) online services (including sites like MySpace, YouTube and Facebook), whose commercial success depends to a large extent on the disclosure by their users of substantial amounts of personal data.

18. **Name**: Convergence

    website: http://www.convergeproject.org/

    Description: Convergence is a rights-based framework based on the principle that every global citizen has a right to a fair share of the earth's bounty and access to fundamental rights. It advocates socio-ecological justice, calling for wealth, wellbeing and consumption to converge across and within nations to a level that this biosphere can support. Convergence aims to enshrine intra-generational equity in the sustainability discourse.

19. **Name**: Crowdmap

    website: https://crowdmap.com/welcome

    Description: Crowdmap is designed and built by the people behind Ushahidi, a platform that was originally built to crowdsource crisis information.A s the platform has evolved, so have its uses. Crowdmap allows people to set up their own map of Ushahidi without having to install it on their own web server.

    Crowdmap allows people to...

    a. collect information from cell phones, news and the web.

    b. aggregate that information into a single platform.

    c. visualize it on a map and timeline.

20. **Name**: DecarboNET

    website: http://www.decarbonet.eu/

Description: A Decarbonisation Platform for Citizen Empowerment and Translating Collective Awareness into Behavioural Change

21. **Name**: Dispora

    website: https://joindiaspora.com/

    Description: A distributed social network giving people ownership over their data

22. **Name**: Ecosearch

    website: http://www.ecosearch.org/

    Description: Search engine dedicated to eco-friendly and non-profit environmental conservation EcoSearch was founded as a nonprofit with the purpose of supporting our environment. This is accomplished in two ways. First, EcoSearch donates to other nonprofits that also support the environment. Second, EcoSearch helps to inform about these wonderful charities being the world's first search engine dedicated solely to preserving our environment. EcoSearch is solely about helping our environment and making a difference!

23. **Name**: Ecosocial forum

    website: http://www.oekosozial.at/index.php?id=1&L=1

    Description: The Ecosocial Forum, a Think-tank and non-profit organisation in Austria, is devoted to promoting the concept of an "Ecosocial Market Economy". Ecosocial Market Economy refers to an economic model, which is based on establishing a balance between economic, ecological und social sustainabilty in the respective cultural context.

24. **Name**: EVERYAWARE

    website: http://www.everyaware.eu/

    Description: EveryAware is an EU project intending to integrate environmental monitoring, awareness enhancement and behavioral change by creating a new technological platform combining sensing technologies, networking applications and data-processing tools.

25. **Name**: Eyeonearth

    website: http://www.eyeonearth.eu/en-us/Pages/Home.aspx

    Description: Eye on Earth is a 'global public information network' for creating and sharing environmentally relevant data and information online through interactive map-based visualisations. The overall goal is to

improve the environment by sharing information and knowledge. We believe 'sharing is everything' - by sharing relevant information, we can expand and improve our knowledge about the environment, to understand better what is happening, and to underpin the need for actions to improve the environmental situation.

26. **Name**: Freecycle

website: http://www.freecycle.org/

Description: This is a grassroots and entirely nonprofit movement of people who are giving (and getting) stuff for free in their own towns. It is all about reuse and keeping good stuff out of landfills. Each local group is moderated by local volunteers. Membership is free-of-charge.

27. **Name**: Freedombox

website: http://freedomboxfoundation.org/

Description: They are building software for smart devices whose engineered purpose is to work together to facilitate free communication among people, safely and securely, beyond the ambition of the strongest power to penetrate. They can make freedom of thought and information a permanent, ineradicable feature of the net.

28. **Name**: Friends of Europe – Les amis de l'Europe

website: http://www.friendsofeurope.org/Home/tabid/1124/Default.aspx

Description: Friends of Europe – Les amis de l'Europe is a leading think-tank that aims to stimulate thinking on key global and European political challenges. Their insightful and timely publications and animated debates provide access to sharp analysis and information. They promote the confrontation of ideas that is vital to policy-making and encourage wider involvement in Europe's future.

29. **Name**: Friends of the Earth

website: http://www.foe.co.uk/index

Description: The members stand for:

a. a beautiful world

b. promoting that people depend on the planet, so let's keep it in good shape.

c. a good life

d. a healthy planet is one that works for people too.

e. a positive relationship with the environment

f. acting together for the planet and everyone who lives on it.

30. **Name**: Funding Circle

website: https://www.fundingcircle.com/homepage

Description: Funding Circle is an online marketplace to help businesses find low cost loans quickly and investors to get better returns. There are no middlemen, no banks, and no lengthy delays. By directly connecting people who want to invest money with vetted, established businesses who want to borrow money, they eliminate the cost and complexity of the banking world. It is simple, better for business, better for investors, better all around.

31. **Name**: Glancee

website: http://www.glancee.com/

Description: Glancee started in 2010 with the goal of bringing together the best of physical and digital worlds. They wanted to make it easy to discover the hidden connections around us, and to meet interesting people. Since then Glancee has connected thousands of people, empowering serendipity and pioneering social discovery. They are therefore very excited to announce that Facebook has acquired Glancee and that they have joined the team in Menlo Park to build great products for over 900 million Facebook users.

32. **Name**: IA4SI

website: http://ia4si.eu/

Description: IA4SI-Impact Assessment for Social Innovation

IA4SI is a support action aiming to develop a structured methodology able to evaluate the potential socio-political, economic and environmental impacts of collective awareness platforms for sustainability and social innovation.

33. **Name**: ICLEI

website: http://www.iclei.org/

Description: CLEI is the world's leading association of cities and local governments dedicated to sustainable development. ICLEI supports cities and local governments in working towards sustainability, whether they are pursuing the ambitious goal to become an

eco-city/green city or focusing on specific goals.

34. Name: Internet of Things

website: http://www.internet-of-things-research.eu/

Description: The aim of European Research Cluster on the Internet of Things is to address the large potential for IoT-based capabilities in Europe and to coordinate the convergence of ongoing activities.

35. Name: iNudgeYou

website: http://www.inudgeyou.com/

Description: The iNudgeYou team work at the intersection of applied behavioural science, public institutions, NGO's and private stakeholders with the aim of developing and scientifically validate behaviour change strategies for closing the gap between pro-social intentions and actions. INudgeYou is thus devoted to help improving the health, wealth, sustainability and happiness of citizens and society at large.

36. Name: Kickstarter

website: http://www.kickstarter.com/

Description: Kickstarer hosts films, games, music, art, design, and technology. Kickstarter includes projects, big and small, that are brought to life through the direct support of people who use it.

37. Name: Landshare

website: http://www.landshare.net/

Description: Landshare brings together people who have a passion for home-grown food, connecting those who have land to share with those who need land for cultivating food.

38. Name: LetslinkUK

website: http://www.letslinkuk.net/

Description: LETS - Local Exchange Trading Systems or Schemes - are local community-based mutual aid networks in which people exchange all kinds of goods and services with one another, without the need for money.

39. Name: Localmind

website: http://www.localmind.com/

Description: Localmind is a new service that allows you to send questions and receive answers about what is going on—right now—

at places you care about. Localmind has been acquired by AIRBNB**.**

40. Name: London data store

website: http://data.london.gov.uk/

Description: The London Datastore has been created by the Greater London Authority (GLA) as an innovation towards freeing London's data. Citizens are able to access the data that the GLA and other public sector organisations hold, and to use that data, free of charge. The GLA is committed to influencing and cajoling other public sector organisations into releasing their data here too.

41.Name: Nesta

website: http://www.nesta.org.uk/

Description: Nesta is an independent charity with a mission to help people and organisations bring great ideas to life. They do this by providing investments and grants and mobilising research, networks and skills.

42. Name: NHS evidence

website:https://www.evidence.nhs.uk/

Description: NICE Evidence Services are a suite of services that provide internet access to high quality authoritative evidence and best practice. The services cover health, social care and public health evidence. Evidence Services aim to help professionals make better and quicker evidence based decisions.

43. Name: OPEN

website: http://www.oneplaneteconomynetwork.org/

Description: One Planet Economy Network (OPEN: EU) was a two year EU funded project (under the EU 7th Framework Programme for Research and Technological Development or FP7). It brought together European and global leaders in the fields of resource accounting, policy and scenario development, stakeholder engagement and project management. The OPEN:EU project developed a comprehensive and foresighted set of EU consumption indicators that was used to create an interactive software tool for EU policy makers - the EUREAPA Tool.

These indicators and the EUREAPA Tool offer greater transparency in decision making and support high quality, informed policy-making, and help transform the European Union (EU) to a One Planet Economy by 2050.

44. Name: Open garden foundation

website: http://opengarden.net/

Description: Open Garden advocates principles of Net Neutrality, enhancing the wireless broadband Internet, equalizing knowledge access and promoting innovation.

45. Name: Opower

website: http://opower.com/

Description: Opower is the market leader in customer engagement for the utility industry. With more than 75 utility partners, their solutions have been deployed to millions of homes across North America, Europe, and Asia.

46. Name: Paradiso

website: http://paradiso-fp7.eu/

Description: The PARADISO initiative, launched in 2007, addresses how ICT in general, and the Future Internet in particular can contribute making this future happen. PARADISO activities are open to any interested individuals or organisations. They include the organisation of international events, the release of a reference document, and the preparation of recommendations to the European Commission.

47. Name: Patientslikeme

website: http://www.patientslikeme.com/

Description: It allows members to compare treatments, symptoms and experiences with other people and take control of own health, share medical experience by giving and getting support and chart own health over time contributing to research that can can advance medicine.

48. Name: Peertopatent

website: http://peertopatent.org/

Description: Peer To Patent is a historic initiative by the United States Patent and Trademark Office (USPTO) that opens the patent examination process to public participation for the first time. Peer to Patent is an online system that aims to improve the quality of issued patents by enabling the public to supply the USPTO with information relevant to assessing the claims of pending patent applications.This pilot project connects an open network for community input to the legal decision-making process. The community supplies information and research based on its expertise. The patent examiner makes the final determination on the basis of legal standards. This process combines the democracy of open participation with the legitimacy and effectiveness of administrative decision making.

With this most recent pilot, searching for prior art will be made faster, easier, and all the more relevant with welcome access to IP.com's acclaimed Prior Art Database, an industry-recognized go-to source for patent examiners and serious searchers worldwide.

49. Name: Personal democracy

website: http://personaldemocracy.com/

Description: Technology and the Internet are changing democracy in America. This site is one hub for the conversation already underway between political practitioners and technologists, as well as anyone invigorated by the potential of all this to open up the process and engage more people in all the things that can be and must be done together as citizens.

50. Name: Planetaryskin

website: http://planetaryskin.org/

Description: Planetary Skin Institute (PSI) aims at improving the lives of millions of people around the world by dramatically enhancing the decision-making capabilities of those charged with addressing the major challenges of food, water and energy security as well as managing risks associated with the increasing impact and frequency of weather extremes. As the pressures and demands on a wide range of scarce resources intensify, decisions to mitigate impacts in one area often have unforeseen and adverse effects in another: a result arising from incomplete information and partial awareness.

51. Name: Reroute

website: http://reroute.it/

Description: Reroute.it is all about making better transportation choices. However, their calculations are only approximations and should be treated as such.

52. Name: Safecast

website: http://blog.safecast.org/

Description: Safecast is a global project working to empower people with data, primarily by mapping radiation levels and building a sensor network, enabling people to both contribute and freely use the data collected. After the 3/11 earthquake and resulting nuclear situation at Fukushima

Diachi it became clear that people wanted more data than what was available. Through joint efforts with partners such as International Medcom, Keio University, The John S. and James L. Knight Foundation and GlobalGiving, Safecast has been building a radiation sensor network comprised of static and mobile sensors actively being deployed around Japan – both near the exclusion zone and elsewhere in the country.

Safecast supports the idea that more data – freely available data – is better. Their goal is not to single out any individual source of data as untrustworthy, but rather to contribute to the existing measurement data and make it more robust. Multiple sources of data are always better and more accurate when aggregated.

While Japan and radiation is the primary focus of the moment, this work has raised awareness of the need for more environmental data on a global level. The longterm work that Safecast engages will address these needs. Safecast is based in the US but is currently focused on outreach efforts in Japan. Their team includes contributors from around the world.

53. **Name**: Safer-streets

website: http://safer-streets.appspot.com/

Description: This is an app to allow people to upload pictures of (or at least an incident report about) those they are threatened by, in a geotagged manner. The main idea for this system can be seen at the BasicIdea wiki page.

54. **Name**: Social innovation camp UK

website: http://sicamp.org/

Description: Social Innovation Camp matches software developers and those with an understanding of a social problem to help them start and grow technology-based social ventures.

55. **Name**: Sociopatterns

website: http://www.sociopatterns.org/

Description: SocioPatterns is an interdisciplinary research collaboration that adopts this data-driven methodology with the aim of uncovering fundamental patterns in social dynamics and coordinated human activity.

56. **Name**: SPREAD

website: http://www.sustainable-lifestyles.eu/

Description: The SPREAD Sustainable Lifestyles 2050 Project

57. **Name**: Sunset-project.

Website: http://sunset-project.eu/

Description: Sustainable social networking services for transport.

The research & development project SUNSET is part of the European Commission's Seventh Framework program Smart Cities & Sustainability (DG Connect) and consists of 9 partners from 4 European countries. The project aims for reduced congestion, reduced air pollution and improved safety by stimulating people to change their travelling behaviour. The members have investigated how positive incentives can stimulate smart and sustainable traveling in urban regions. The mobile Tripzoom-app has been developed as a proof-of-concept to improve the personal mobility of travellers and to share information. Project's innovations have been evaluated in real life settings n the cities of Enschede (NL), Gothenborg (SE) and Leeds (UK).

58. **Name**: Sutton Open Library

website: http://suttonopenlibrary.wordpress.com/

Description: Sutton Open Library is a new way to share books and make friends in the borough.

59. **Name**: The Eatery

website: https://eatery.massivehealth.com/

Description: Using The Eatery, the members can snap photos of own food. It gives something much more helpful than calorie counts. It provides a big-picture breakdown of own habits, including strengths, weaknesses, and the best places to start making a change.

60. **Name**: Thecube

website: http://thecubelondon.com/

Description: Thecube is a curated, diverse and smart community of scientists, engineers, designers, technologists, artists, futurists and anthropologists. They help members innovate through their events, innovation labs and one to one mentoring. As a community they actively collaborate to create innovative solutions via their consultancy and independent projects.

61. **Name**: Thimbl

website: http://www.thimbl.net/

Description: Thimbl is a free, open source, distributed micro-blogging platform. Thimbl is for those who are weary of corporations hi-jacking their updates to make money, or being locked into one micro-blogging platform

62. **Name**: Unglobalcompact

website: http://www.unglobalcompact.org/

Description: The UN Global Compact is a strategic policy initiative for businesses that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption. By doing so, business, as a primary driver of globalization, can help ensure that markets, commerce, technology and finance advance in ways that benefit economies and societies everywhere.

63. **Name**: Urban Eco Map

website: http://urbanecomap.org/

Description: create people awareness to take eco-conscious decisions at local level

64. **Name**: WeKnowIt

website: http://www.weknowit.eu/

Description: WeKnowIt is a 3 year Integrated Project developing novel techniques for exploiting multiple layers of intelligence from user-generated content, which together constitute Collective Intelligence, a form of intelligence that emerges from the collaboration and contributions of many individuals.

65. **Name**: Who Owns My Neighbourhood?

Website: http://whoownsmyneighbourhood.org.uk

Description: Who Owns My Neighbourhood? aims to give people a starting point for getting things done in their own neighbourhoods. It makes it easier for people to have conversations about their local area and to answer each other's questions by sharing what they know. It helps people to think about what personal responsibility each is willing to take for the place where they live, and how they might be able to help each other to look after it.

66. **Name**: Zilok

website: http://uk.zilok.com/

Description: Zilok - Rent anything online from individuals and business.

67. **Name**: Zopa

website: http://www.zopa.com/homepage/home-v9

Description: Also known as social lending or lend-to-save, peer-to-peer lending, works by individual savers and borrowers coming together to get better rates. Zopa matches sensible borrowers looking for low rate loans with smart savers looking for high interest on their savings. Zopa's peer-to-peer loans offer borrowers competitive low rates and flexible terms with no early repayment fees or hidden charges.

68. **Name**: Crowdcube

website: http://www.crowdcube.com/

Description: Crowdcube helps startup and growing businesses to raise business finance by letting people invest via their equity crowdfunding platform.

4.3 Applicative Field

We have divided the CAPs according to the target field. As Figure 1 suggests sustainability, ITC and Sociology cover almost 60% of the total.
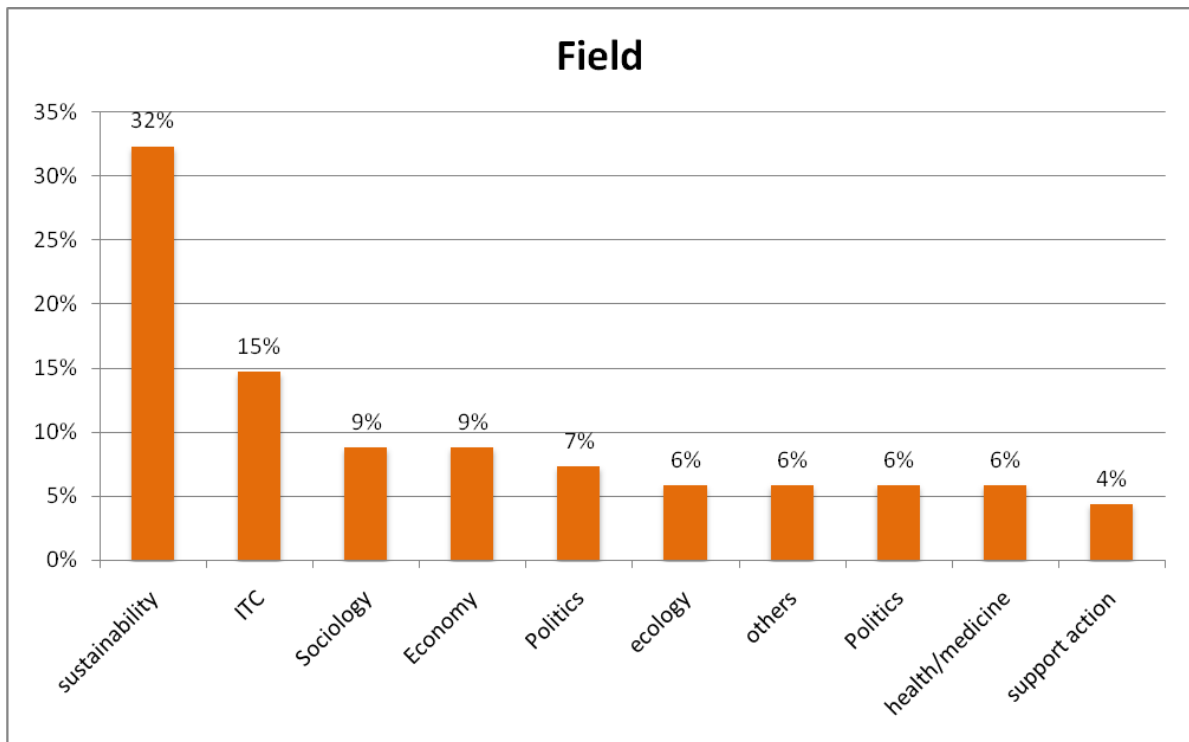
Figure 1. Application field of CAPs

4.4 Health Status

In Figure 2 we show the result of the question about the activity level of CAPS (as per the information available from their web site). Some may have moved their activity to other media (such as Facebook).
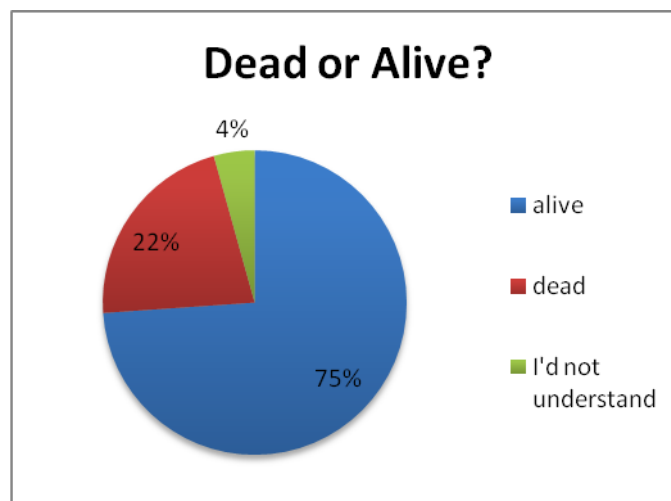

Figure 2. Dead or Alive?

4.4.1 Funding

In Table 1 we report the name and the typology of the inactive CAPs.

Name	Typology
BeAware	European project
CATALYST	European project
Commission on the Measurement of Economic Performance and Social Progress	French government's initiative
Communia	European Commission within the eContentplus framework
Consent	European project
Converge	European project
Glancee	n/a
LetslinkUK	Localmind has been acquired by airborne
OPEN	European project
SPREAD	European project
Sutton Open Library	n/a
The Eatery	n/a
WeKnowIt	European project

Table 1. Name and typology of inactive CAPs

4.5 Audience

An important aspect of the study of CAPs is the evaluation of the audience, understood both as a number and as a type of user. Figure 3 refers to the geographical target
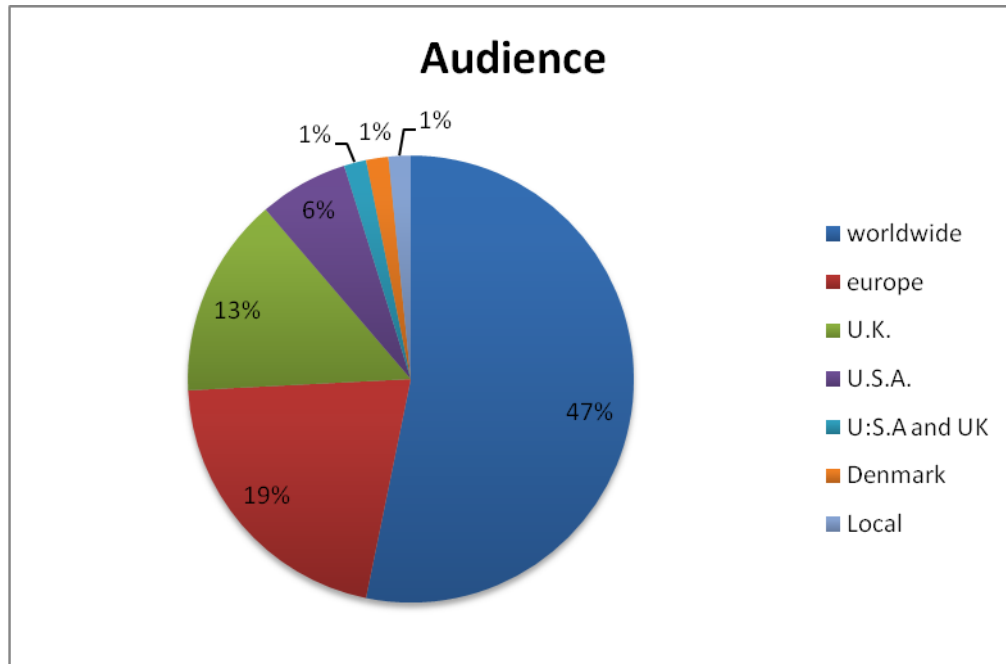
Figure 3.Geographical audience

It is very difficult to estimate the number of users only by using the web site in many cases. Only few of them quote explicitly the number, as one can see in Table 2.

Name	Audience (estimated number of participants. Who are they? Target?)
2050 Pathway simulator	The Department of Energy and Climate Change (DECC) is now working with countries around the world to help them develop their own calculators, and is also building a Global Calculator to look at ways to reduce emissions worldwide.
avaaz	32,011,746 members worldwide 166,596,344 actions taken since January '07 194 countries with Avaaz members Avaaz is a truly global movement, bringing together people from every country on earth - from Brazil and France, with more than one million members each, down to Montserrat (81 members) and Nauru (103). Avaaz members are evenly distributed by age: the community has roughly an equal share of young, old, and middle-aged people. Just over half of Avaaz members are women. Members work in every imaginable sort of job; others are retired, hold no job, or are in school. The one thing that unites members is a commitment to a better

Name	Audience (estimated number of participants. Who are they? Target?)
	world.
BeAware	4 families in Italy, and 4 in Finland, participated in the first BeAware Trial. The total number of participants was 24 people (13 in Finland and 11 in Italy). The second phase will also include Sweden as trial site. Specifically, 5 families in Italy, 5 in Sweden and 2 in Finland will be participating to the second BeAware trial, together with the controlled environments (2 in Italy, 2 in Sweden and 2 in Finland). An on-line survey has been developed and been made available on website http://www.energyawareness.eu/beaware/research/survey/ to highlight some socio-demographic factors that affect conservation behaviour and awareness, and to measure the perception of waste attributed to certain consumption behaviour. The current version of the survey, with more than 1200 respondents so far, was built based on the results of a large paper and pencil survey with 400+ people in Finland and Italy, and on a series of pilots in Italy, Sweden and Finland.
Birmingham civic dashboard	7206 contacts
caps2020	all CAPS projects
CATALYST	40 researchers, practitioners, businesses, networks and policy makers in a Think Tank designed to facilitate face-to-face and virtual exchanges on best practices in natural hazards and disaster risk reduction and adaptation.
CHEST	CHEST at involving citizens, students, researchers, institutes, organisations, enterprises, all interested in investigating in social innovation.
Communia	The founding members are 36, with five more members added in September 2008, and ten more added at the beginning of the third year (September 2009) –making a total of 51 members. 500 likes in Facebook - 345 followers in twitter
Consent	Articles in scientific journals and papers presented at conferences in several languages making CONSENT's findings accessible to universities, scholars and researchers; Policy briefs relevant for policy makers at European, national as well as regional levels;

Name	Audience (estimated number of participants. Who are they? Target?)
	Policy recommendations based on findings in CONSENT;
DecarboNET	DecarboNet monitors (and triggers) behavioural change on the individual and the collective level, from small ad-hoc communities to established groups and large-scale engagement campaigns.
Ecosocial forum	Researchers
freecycle	Made up of 5,118 groups with 6,687,729 members around the world. 215.145 likes in Facebook.
Freedombox	The target user is the average consumer.
Friends of Europe – Les amis de l'Europe	Friends of Europe seeks to offer a voice to groups not traditionally represented in the EU debate, but who can make a difference: from regular citizens and young people to explorers on topics such as climate change and people on the ground addressing development issues.
IA4SI	CAPs projects, projects' users and European citizens.
ICLEI	A powerful movement of 12 mega-cities, 100 super-cities & urban regions, 450 large cities, 450 small & medium-sized cities & towns in 86 countries dedicated to sustainable development.
Internet of Thing	45 European projects
iNudgeYou	A network of researchers, practitioners, stakeholders and policy-makers interested in using and developing, but also cautious about, the use of behavioural theory by public institutions and private organisations.
kickstarter	Since its launch in 2009, 5.4 million people have pledged $919 million, funding 53,000 creative projects
Landshare	55,000 growers, sharers and helpers, divided in groups, only in England.
NHS evidence	NICE Evidence Services are for everyone in health and social care who makes decisions about treatments, interventions or the use of resources. While NICE

Name	Audience (estimated number of participants. Who are they? Target?)
	Evidence Services are designed primarily for professionals and practitioners, patients and the wider public are also able to search most of the content.
OPEN	Eight international partners were involved in the project, which brought together European and global leaders in the fields of resource accounting, policy and scenario development, stakeholder engagement and project management.
Opower	Our platform now reaches more than 22 million homes around the world.
paradiso	PARADISO activities are open to any interested individuals or organizations. They include the organization of international events, the release of a reference document, and the preparation of recommendations to the European Commission.
patientslikeme	More than 220,000 members 2,000+ conditions 35+ published research studies. Over 1 million treatment & symptom reports.
safecast	Safecast was created 1 week after the 3/11 Japan earthquake. A small core team, with more than 100 regular volunteers worldwide. The team is concentrated in Tokyo, with smaller support teams globally. Initially funded via Kickstarter and private donations, Safecast has received a grant from The John S. and James L. Knight Foundation. They have deployed over 800 sensors currently, as of December 2013, over 14,000,000 data points collected. All data collected and published by Safecast is open and available under CC0 dedication.
social innovation camp UK	Software developers and social innovators. 450+ ideas have been submitted in the UK since January 2008 and over 30 prototype social ventures have been built.
sociopatterns	Researchers and developers from institutions.
sunset-project.	Policy makers, citizens, road authorities, transport service.
unglobalcompact	This ever-increasing understanding is reflected in the Global Compact's rapid growth. With over 10,000 participants and other stakeholders from over 130 countries, it is the largest voluntary corporate responsibility initiative in the world.
Zopa	Launched in the UK in 2005 –they are in their 9th year with 45-member staff in their London Office, Zopa has lent over £441 million - over £165 million in the last year. It

Name	Audience (estimated number of participants. Who are they? Target?)
	has over 45,000 active savers and 71,000 borrowers. Over £28m in interest earned by savers since Zopa was launched.
crowdcube	57000 investors, 92 business.

Table 2. Quantitative data

4.6 Target

We tried to estimate the target audience of CAPS from their description from web sites. Figure 4 shows an analysis of the audience divided by category of users that may be involved in a CAP. As can be seen, almost half of the CAPS analyzed are addressed to citizens and another 20% are dedicated to researchers.
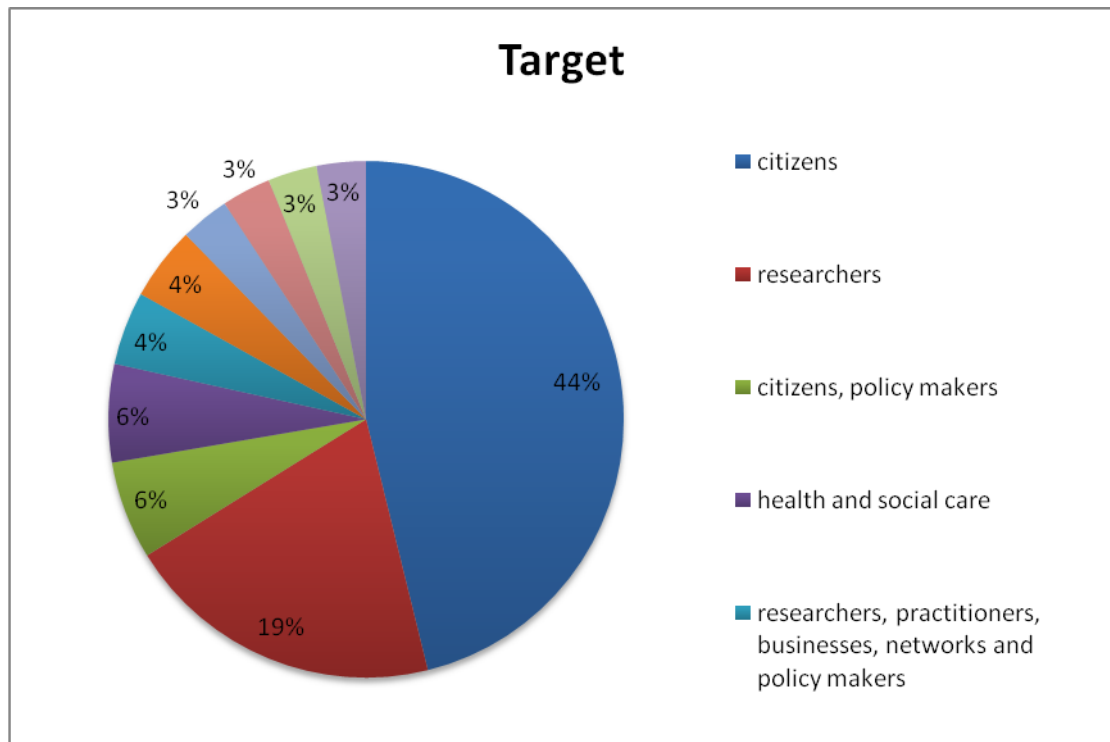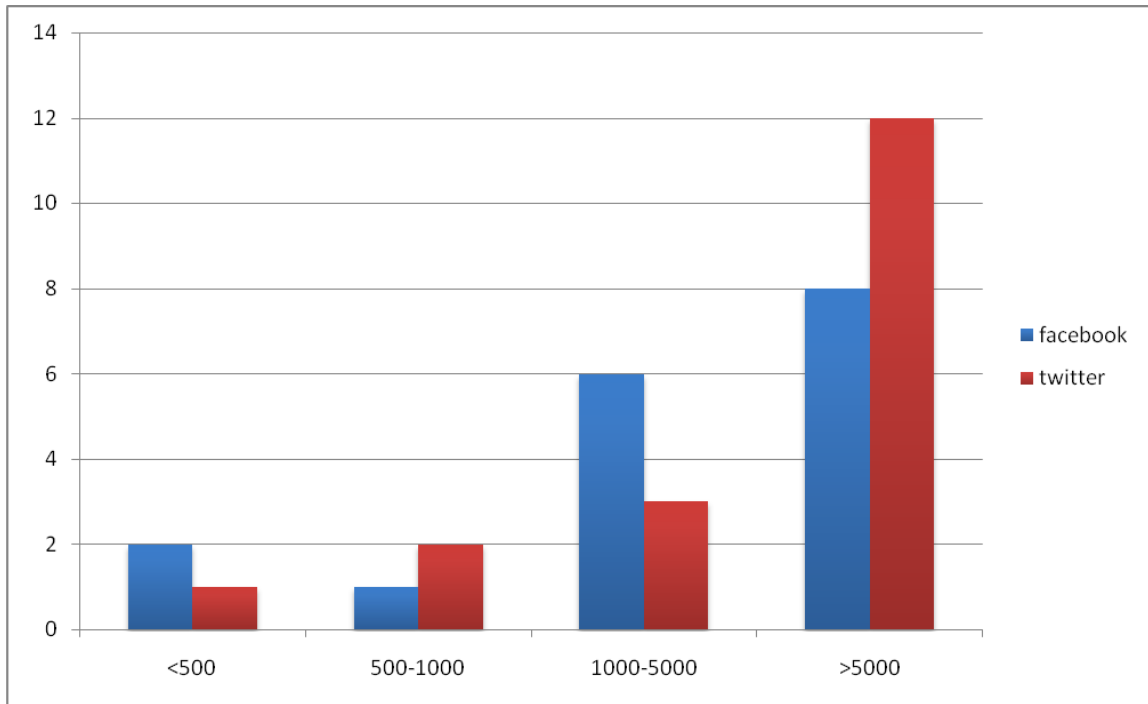

Figure 4. Targets

4.7 Social media impact

For many sites we collected related information about Facebook and Twitter activity. In Figure 5, the horizontal axis shows the number of likes/followers; the vertical axis shows the number of CAPs.

Figure 5. Social media impact

5 Survey for CAPs coordinators

We have still working on the analysis in order to design an effective and quantitative questionnaire, a draft of which is schematized below. We can also profit of the occasion to inquiry about the use of participative instruments, and to ask if they agree to pass a questionnaire to their users. Schematic draft of the quantitative survey includes:

1. Name of the CAP
2. Web address/Facebook/twitter/email and other social media
3. Short description
4. Web app? / portable app?
5. Field (multiple choice)
6. Budget and funding scheme: public (EU or national project? Other sources?), profit, user's participating, crowd funding
7. Targeted audience (and: closed or open?)
8. Number of users (who are they? Gender, education and other socio-demographic data). Time trend.
9. How do users interact? (web, Facebook, twitter..)
10. Community structure of users (if any): do they form groups?
11. Communication: how they interact, if they communicate only to the coordinator or also among themselves, number of estimated messages.
12. Payoff (multiple choice). How does it behave with the number of users?
13. Benefits and incentives (beyond payoff)
14. Reputation and gaming. Is there a score system? Are users recognisable (e.g., by some id) or anonymous?
15. Privacy dimension: what amount of personal data is required? Are there privacy concerns among users?
16. Emotional contents (to be expanded with the help of psychologists)
17. Participative instruments used.
18. Do they agree to pass a dedicated survey to their users?
19. Possible synergies with other projects
20. Dead, alive or completed? Insights from the experience.

Preliminary results are presented in the sequel. First, as Figure 6 suggests, the majority of CAPS are at an early stage.
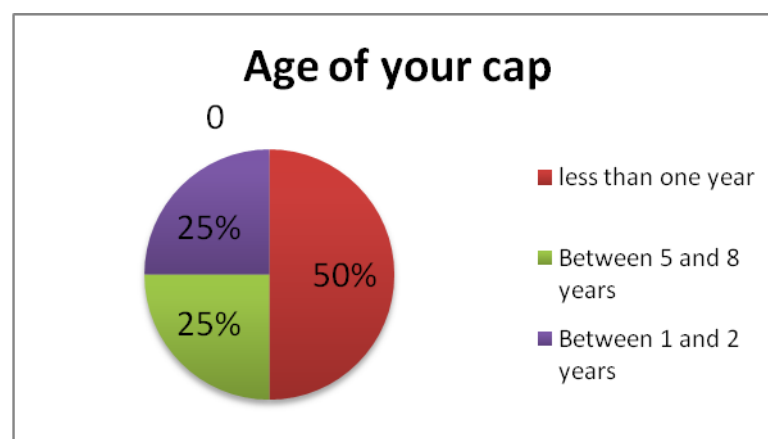

Figure 6. Age of the CAPS

Figure 7 shows particular instances of (social) media that CAPs regularly use to disseminate information to their users and other interested parts.
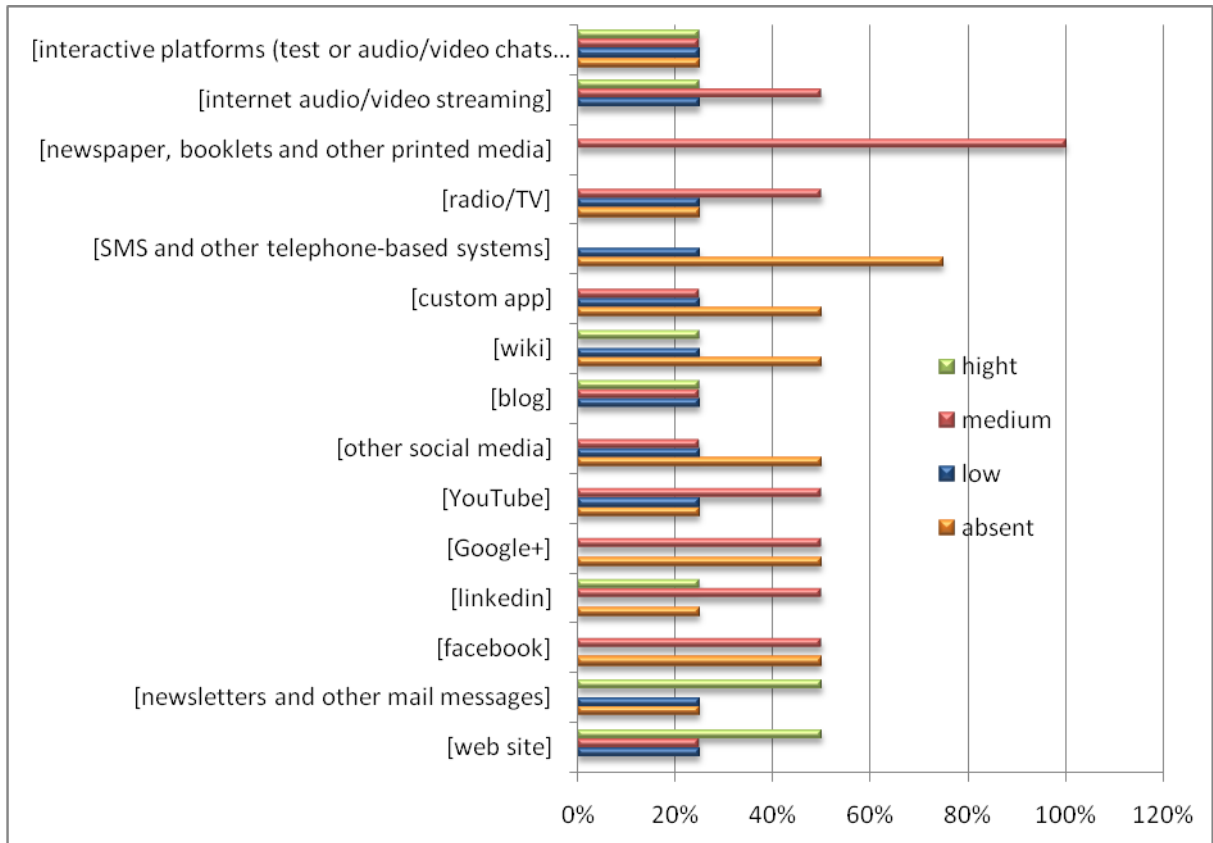
Figure 7. Web and social media

6   Preliminary approach for modeling CAPs

People are willing and capable of adapting their behavior in order to support sustainable lifestyles if the necessary feedback, support, and incentives are provided. For instance the social influence of the community is recognized as an important factor in energy saving initiatives. Timely electrical consumption feedback (through smart metering), is believed to reduce domestic electrical consumption by a fraction of 5-15% [4]. Social norms can motivate people to question their behavior, if they discover it is not "normal" [5]. People tend to learn from their social networks and receive encouragement and support. Nowadays, people who are forced to cooperate to achieve a common goal tend to form a trust between them, influenced by their action [6]. Receiving daily feedback and taking sustainable actions in a social context can increase people's effectiveness [7].

A good understanding of the mechanism that drives human behavior in a collective awareness and participatory environments, is a key factor for modeling CAPs features.

The main point to be considered is the fact that our cognitive capacities have been selected within a given environment. Beyond the biological constraints, the main selective force that shaped our capacities is sexual selection, in the form of access to reproductive partners [8]. In fact, the simple selection for survival has little effect on a sufficiently structured society, that is able to provide basic assistance to all members (i.e., at least those that survive after the embryonic development), and moreover possess such a complex structure so that different capacities find their place.

The sexual selection surely shaped our body, as did with almost all sexually-reproductive animals (e.g., just think of the ornamental aspects of many birds such as the peacock). This selection also shaped our brain, favoring (selecting) all the "useless" characters (i.e., the taste for music, dancing, art, probably our sophisticated speech abilities, and effective social problem solving capacities). Indirectly, since one of the main factors for reproduction is social power, it also shaped our social (and Machiavellian) brain. In human society, the key for success is not the body strength, but rather the capability to form alliances and to outwit others.

However, stable alliances imply trusting, and we have several mechanisms for enforcing this aspect: the natural tendency of revealing liars by uncontrolled gestures or displays (e.g., blushing), the sense of loyalty and justice, the reputation and privacy mechanisms [9]. These are the mechanisms still in force for "modern" cooperation even in the cybernetic word.

It might be argued that sexual selection furnished the "gross" texture, i.e., dexterity, language, sense of beauty, metaphors, art; in a few words, our "big brain". However, the technological "run-out" (as an analogy with the sexual competition that promotes the development of more and more conspicuous ornaments) is surely due to trading [10]. The specialization and the necessity of knowing who is worth trusting and how to detect liars arise with the commerce and the bargain. These aspects are probably the main promoters of our "collective intelligence" [11]. In analogy with an ant nest with its specialized casts, we are continuously developing specialization and solving collectively optimization problems, adding innovation through cognitive (rather than simply genetic) evolution [12]. What is emerging in the present Internet world is the capability of addressing collective efforts in developing big "operas that are neither driven by profit nor

sponsored by a private or public entity: just think to the Linux kernel or to Wikipedia, or the mass of Internet pages and free apps [13]. The reputation component is surely an important driving force in this phenomenon.

On the other hand, we (as primates) also developed a fierce tendency to forming gangs, developing identity signs (for instance, dialects) allowing for an easy determination of "stranger", and suspicion of "foreign" groups. Global love was never a viable option.

In particular, it seems that we use different cognitive structures for different tasks. Concepts such as bounded rationality [14], the pre-attentive mechanisms producing effects such as cognitive blindness [15], and perceptive magnification, seems to be properly intertwined and continuously tuned so as to concentrate our attention, making our cognitive system effective in solving social problems and collective decision making. Such mechanisms are presumably the reason why special "social numbers" can be observed in humans and primates [16], suggesting how a different social structure could have been evolved in order to solve particular tasks, by means of particular cognitive processes.
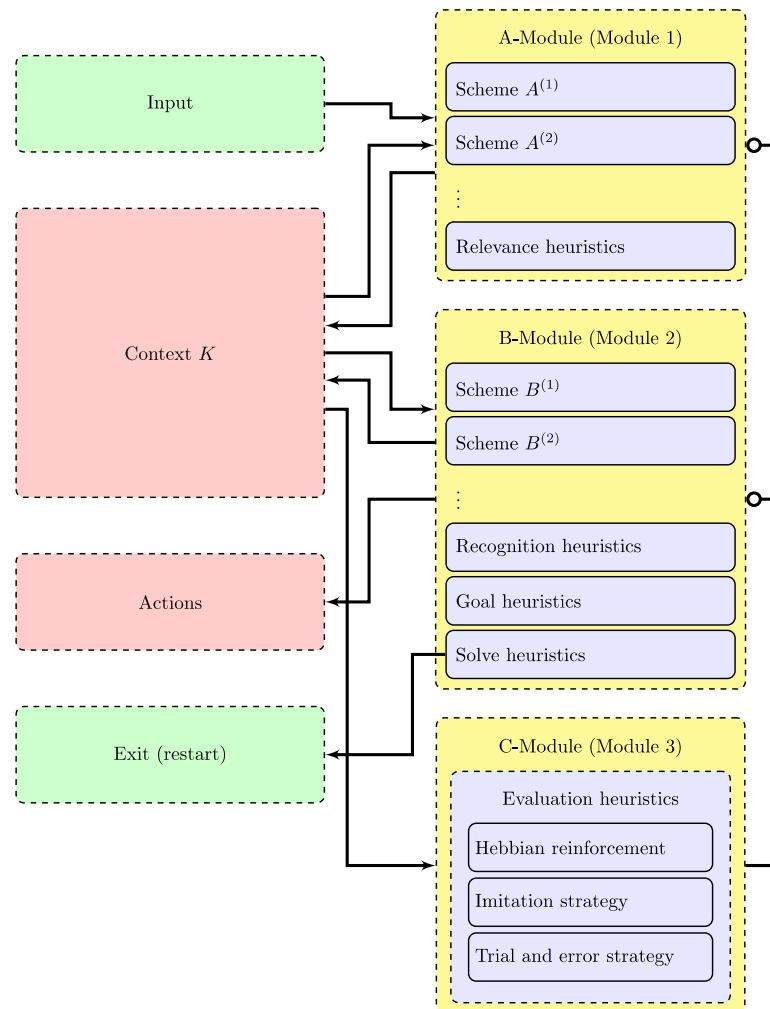
Figure 8: A schematic representation of the Tri-partite model

Mental schemes and the Tri-partite model of cognition: In order to take into account the complex set of coupled cognitive processes and mechanisms, we developed a dedicated model of cognitive activity (the Tri-partite Model [17]), explicitly devoted to the representation of the three main aspects of the

cognitive activity, the unconscious perception mechanisms, the conscious elaboration and the learning dynamics, so obtaining a general model with three different sections (see Figure 8).

The first module is related to perception and unconscious elaboration of data from the external world. The activated schemes filter the outside information and populate the internal context, which may trigger the activation of further schemes. The chains of activated schemes essentially constitute the awareness of the node, while the sum of its entire set of schemes represents the knowledge of the node. There are meta-schemes that control the work of processing, avoiding conflicts between schemes, and promoting a response when time is short. This first module is the fastest one and essentially out of conscious control in humans.

The second module concerns actions, i.e., with outputs and reasoning, but also with emotions. It works in a similar way to the first one, but its actions are well characterized by longer response times (i.e., frequently easily measurable/assessable). Conflicts among schemes and regulative actions (e.g., the resolutions of cognitive dissonance) can be detected by reaction times.

The third module, the slowest one in terms of reaction time, concerns the learning, simulation and planning phases. They act by evaluating the performances of the chains of schemes and the fulfillment of goals by optimizing the activation patterns and scores of schemes.

This model was developed in the context of the FET project RECOGNITION [18] aiming at understanding the heuristics- based mechanism of decision making in the presence of incomplete information and/or a limitation of processing resources. Based on this exploration, we are confident that the proposed modular architecture has sound potential in capturing, at a sufficiently simple level, the complexities associated with human-driven decision-making in a collective awareness and participatory engagement environment.

In particular, we are applying this framework to the human online communication systems. Humans developed several modalities of exchanging information, of which the "verbal" content is just a part. Simply consider how the transcript of an interaction appears uninformative and unnatural, without the nonverbal components. When using an online communication channel (e.g., chat, forums, email), humans are exploring new communication media, face new challenges when taking decisions, while at the same time they are exposed to stimuli, information and opportunities for social interaction, altering their cognitive and behavioral characteristics.

On the other hand, the electronic media offer an -almost- ideal experimental framework, in which it is possible to capture almost all the communicated information, with accurate timing and already in digital form. Our preliminary investigations are presently devoted to establish the reference framework (communication network structure in the presence of different tasks) [19]. We are currently designing interactive cooperative games to explore the basic ingredients of collective intelligence.

7 Conclusions and on-going work

In this document we have searched and reported on 68 CAPs instances, providing information about the subject of the actions, the health state, number of participants, operational community/group/ hierarchical structure and available communication means. We also present the form and scope of the preliminary quantitative survey currently administered to CAPs coordinators in an effort to detect the perceived importance of relevant socio-psychological, market and privacy CAPs dimensions.

Based on the listed, surveyed CAPs instances, we are developing a CAPs modeling approach. We are presently developing models of individuals interacting by means of virtual instruments (based on real experiments), and classifying CAPs on a small number of relevant axes. We believe that the actual interplay of users and CAPs in a competitive/collaborative scenario is a dynamic problem that can better understood by means of simulations. We are therefore developing an agent-based model that takes into consideration the CAP characteristics (as emerging from the survey) and user's profiles. The user participation in a given CAP is determined by the match between the CAP characteristics (that may include "irrational" elements), the expected gain vs. cost, and the influence of privacy, reputation, and gaming components, according to the cognitive model of users. Users also react to peer pressure, modulated through the personal community structure. On the other hand, CAPs compete for users' resources (mainly time and participation) and interact among them, also contributing to the formation of a users' community structure. The way the gain (payoff) and reputation components depend on user participation couples users' dynamics with CAPs dynamics. With this activity we will identify useful parameters to validate the model using static data (those from the survey), possibly offering a way of assessing the "health status" of a CAP using "passive" measurements, i.e., data gathered during the normal activity of the CAP, without necessarily the need of directly contacting users and coordinators.

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