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Glossary

Acronym	Definition
API	Application Programming Interface
Application	Any kind of meaningful use of open data. (As-of *"application areas of open data"*)
[Mobile or Web] App	A self-contained program or piece of software, especially designed to be downloaded by a user on a mobile device or personal computer.
Commons	Often used in phrases such as "a new commons" or a "global commons", the term refers to a new form of a common good, typically created by people through collective action and shared by the community (T de Moor, "From common pastures to global commons: a historical perspective on interdisciplinary approaches to commons", 2011).
Challenge	A widespread call to action to participate in an open contest (like a Hackathon) for improving or renovating an existing situation.
Citizen	An inhabitant of a particular town or city.
Citizen initiative	An initiative proposed by a (collective of) citizen(s), which ideally is informing the challenges for the hackathon process.
Fablab	A physical place where anyone can make an idea concrete by transferring and fabricating those ideas through the use of 3D printers and other (complex) technological devices. The staff and peers at Fablabs empowering people to build their ideas; they support them in doing it themselves, but do not execute the work for them.
Hackathon	Generally understood to be a collaborative event almost exclusively of software developers, that typically lasts two-three days and is intended to result in the production of one or more apps. In the Open4Citizens project, the hackathons include a range of participants with different areas of expertise and solutions being developed are not limited to apps.
Maker culture	A global trend of consumers becoming co-creators of new products and services (MD Gross and E Li-luen Do, in "Educating the New Makers: Cross-Disciplinary Creativity", 2009), encompassing democratization of digital production technologies (among others, FabLabs), and open source and other informal styles of software development (among others, hackathons).
Mock-up	A sample, or a low-definition, non-functional prototype of an app or a service resulting from the co-creation work in the hackathon event
Non-expert	A person without professional or specialized knowledge in a particular subject

user Non-IT savvy user	(here, we refer to expertise in computer programming and/or data skills in the context of the Open4Citizens project); also, non-data expert user with no particular IT and programming-skills
O4C approach	A workflow based on three consecutive phases: 1) Pre-hack; 2) Hack; 3) Post-hack.
O4C platform	The online digital platform supporting the hackathon process with technological resources, methodological suggestions and data.
Open Data	Data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and share alike. Source: http://opendatahandbook.org/guide/en/what-is-open-data/
OpenDataLab	The physical infrastructure the Open4Citizens project intends to conceive, in order to support citizens' participation to co-creation with open data.
Public service	A service provided by a government body to people living within its jurisdiction, either directly (through the public sector) or through financing a third party (agency or subcontractor).
Social impact	The effect induced [by a certain project or initiative] on the well-being of a community (and/or a less integrated group of people)
Social sustainability	The ability of a community to develop processes and structures which not only meet the needs of its current members but also support the ability of future generations to maintain a healthy community. Source: http://www.businessdictionary.com/definition/social-sustainability.html#ixzz2y75dJTij
Urban services	Services at the urban scale, aimed at creating public utility. They are not necessarily initiated by the local government.

1   Executive Summary

The aim of this deliverable is to create a single booklet-style document with clear policy recommendations for the development of OpenDataLabs, the involvement of public and private institutions and the engagements of citizens, communities and interest groups, as a result of the best practices and lessons learnt on the project.

The document is structured as follows. The next section describes open data policies at an operational level. We further discuss the process of data disclosure and distinguish between data availability and data usability. This is not straightforward. We, therefore, also provide actions to enhance the meaningful use of open data, including data dialogues, data awareness and data use, and data literacy.

In the fourth section, we summarize the relevant steps to reuse data as commons. We stress the importance of *public data ownership, data related education, and data oriented urban policy*, to have data as a valuable resource for developing a new generation of public services. We conclude with a further perspective, in which the OpenDataLab is well-established in the local community. In this perspective, the community around the OpenDataLab is expected to act as catalysts to change.

2 Open Data policies

Policies to guarantee a standard data disclosure behaviour by public administrations are still needed and ask for a threefold operational level:

1) to set up norms and working routines that avoid data disclosure to be an additional work by public officers and technicians;

2) to set up an administrative culture that makes data to be considered as commons, despite the still deep silos-like structure of many, most, public administrations.

3) to set up policies for the consolidation of shared practices for data re-use

For the first level, norms are needed to guarantee that any administrative procedure or service is implemented and/or tendered having as a clear goal data collection and accessibility within the wider framework of privacy protection norms.

For the second level to be accomplished, organizational and behavioural guidelines and rules, when necessary, have to be applied to push data sharing and utilization among the different units of the Public Administration being this the first relevant step for a wider data sharing/disclosure mechanism.

The third level should aim at *infrastructuring* processes of development of shared practices, that allow the larger possible basis for re-using data in various forms, from visualisations to the production of a new generation of public services.

Policies supporting the use of open data should be embedded in bottom-up initiatives, that raise the awareness of the opportunities offered by this resource and close the gap between data production and publication - the *production* side - and the communities' capability to make meaningful use of open data - the *demand* side. Collaboration, commitment and motivation is necessary across all levels of the 'data chain' although perspectives and priorities may vary depending on needs, fears and opportunities - e.g., among top level politicians and the municipal employees who make data openly available. Such policies should therefore aim at:

- **Feeding open datasets**: strengthening a demand for data could also help defining the production of new datasets, specifying what data are needed, what formats, what aggregation of data are more interesting.

- **Creating communities of practices**: Developing, promoting and disseminating practices, tools, algorithms and APIs, would support the growth of a new generation of public services.

- **Consolidating knowledge**: An infrastructure is needed, that could help collecting the knowledge generated by individuals, events and open data campaigns. Like FabLabs became physical reference centres for exchanging knowledge and competence on physical fabrications, OpenDataLabs can become a one stop shop for open data initiatives, they can

inspire citizens, assist and encourage the organisation of events, incubate the best ideas and support continual development of the arena.

3   Data availability versus data usability

Data disclosure is the process of making data open. This is a critical strategic activity as it is mainly related to public administrations and in general to public actors and it required, and still requires, a consistent data management plan and strategy with a corresponding coherent organization. Although many cities announced their approval of data disclosure policy and agenda it is still true that most of the data made open, they are not published in the best "open" format and also some key data sets, although existing, are not disclosed. Making data available to the public is still an issue as most of existing data sets are not disclosed and made available.

Once data are made available they are not usable by anybody and this is for two different reasons:

1. unlike for business or data expert domains, the use of open data as a resource for dealing with daily life problems is not a widespread practice and this makes available data invisible to a large portion of the society
2. even when data are recognized as a relevant resource, people can be prevented from their use as for the lack of data usage literacy; using data, manipulating data, visualizing data, analysing data, require a certain level of practical skills that are not largely diffused in our societies.

This means there is a gap between data availability and data usability that needs to be covered with respect the two issues above. In order to cover the gap some actions can be implemented, taking into account the gap between available and useable data:

a. developing public collective initiatives to discuss and debate on data as being a resource to be used for the creation of collective products/services oriented to the common benefit;
b. developing agencies and initiatives acting as intermediaries between data-experts and non-data-experts so that data are "used" by non experts although not directly dealing with, and/or handling them;
c. developing initiatives and creating opportunities to increase data literacy among non-data experts.

These three actions are those that the O4C project has imagined to be carried out by the OpenDataLabs, which are complex ecosystems aiming at creating a data culture, to supply expertise for data use, and providing initiatives for data literacy.

3.1 Data dialogues

Having data disclosed by public administrations can be mainly beneficial, and is in fact beneficial, for private companies already having a data based/driven business concept. Transforming open data into a resource for the common good requires a level of awareness on both the data resource and the way (a practice) to transform them into products and services having a collective, societal value.

Such an awareness is not only the result of training and educational initiatives; it is rather a cultural change that can be achieved by a complex system of initiatives including collective public discussions. Engaging citizens and domain experts (not being data specialists) in discussions related to the roles of data, to their collective potentials, to the relevance of policies and practices for transforming them into collective useful products is supportive of such a vision. For open data to be considered as a resource for the entire society a complex vision needs to be created and largely shared, also by using evidences (best practices, experiments, use-cases, etc.) giving an operational value to such concepts.

Debating on data through data dialogues should be guaranteed by public agencies in collaboration with an ecosystem of actors. Such dialogue should consider any possible data resources, possible data based/driven solutions, lessons learnt, and usage stories.

3.2 Data awareness and data use

Once large awareness has been developed on the relevance of data, on their availability, on the opportunities they offer, data usage is not yet guaranteed. The use of data requires two different abilities: 1) identification of use (knowing what to do with data, creating a direct relation between data and a product/service they can feed or enable); 2) technical capacity to handle them and to create solutions.

Both these abilities may be supplied to citizens by intermediary agents engaged in data usage initiatives where citizens are mostly the owners of the challenges and data experts, designers and developers are involved in co-creation processes. Such environments, as some of the hackathon experiences carried out in the Open4Citizens project, consider data literacy as a secondary effect of the co-creation, whereas the main target is the usage of data and a response to citizens' problems. Within this perspective, public administrations are asked to create and supply services oriented to guarantee citizens with effective data usage and service development competences so to bridge the gap between data awareness and data usage for collective and public benefits.

3.3 Data literacy

In preparing future generations for the challenges of the 21st century, technical literacy is crucial in ensuring employment for the era with upcoming technology breakthroughs (i.e., extensive automation). Towards this goal, improving the overall data literacy of societies is a step forward. Current debates on personal data, General Data Protection Regulation (GDPR) and so forth, highlight that the general public is still learning its right and getting aware of current internet business

practices (where services offered for free rely on personal data sold for marketing purposes). Currently, training data literacy for the masses is still in its infancy. People gain data competencies primarily through learning more about computation (e.g., programming) or working with technology for professional purposes (e.g., using Excel on a daily base). In this way, people gain competencies in how to acquire, transform, store or visualize data, with the premise to use these competencies even to shape new solutions. These are clearly above average tech-savvy competencies, and indicating a demographics with higher data literacy. However, the needs of non-experts and the less technology literate are not addressed. What is data? What are the basic principles? How to ask a question that can be addressed by data? Such questions are fundamental, and should be the starting points for a non-expert data literacy. Public administrations could offer clearer and more structured support to address the fundamental data literacy developments of the general public, for empowering its citizens in having informed control over their personal data and be aware of consequences of using digital services. This would represent a first level of basic information. A further step towards citizens' ownership of this resource would be to empower citizens in designing with data and innovating new online services, straight from the citizens' perspectives.

4   Towards a valuable and operational concept of public data[1]

Data are a new commons: they are a valuable resource for developing a new generation of public services, however the activation of this new resource as a commons requires that a community is taking care of it and a set of practices and infrastructures are consolidated (Morelli, Mulder et al. 2017). Inclusive open data events and campaigns foster citizen participation through personal development/learning and activation of citizens around issues and opportunities.

The concept of data as a new commons does not refer to single datasets, but rather to the aggregation of multiple datasets and to their availability to a general public in any useable form

This is why we consider relevant the concept of "public data". Public data are not only commons, they are also a valuable output of the urban life continuously produced in urban environments: it is not only the result of a disclosure mechanisms of public administrations and institutions, but rather, and more generally, an individual output collaboratively produced. Within this perspective three relevant policy issues can be identified:

   a) *public data ownership*: whose data is public data when it is produced, collected, interpreted and utilized in the city for the city in a collective whole?

   b) *data related education*: how to guarantee both the awareness on the relevance of public data and the access to it?

   c) *data oriented urban policy*: what policies are needed to guarantee the public and collective utility of public data?

The concept of public data refers to an ethical and democratic dimension of implementation and exploitation of urban services and asks for a relevant reflection at the level of policy making.

4.1   Public Data ownership

The biggest issues to be tackled by public policies are clearly stated in the following questions: are data owned by data producers, or by actors collecting and analysing them, or rather by data users? Who cares about public data once they have been protected against privacy violation? How to make them usable, by individuals or by a collective agent?

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[1] Several of the reflections described in this chapter have been produced by the participant to the workshop on "public data and the city" organized by Fondazione Feltrinelli within the framework of the "about a city" initiative and are available in the document prepared by Ilaria Vitellio (www.mappi-na.it), coordinator of the workshop, as report of the workshop.

These questions do not only refer to data sets which may be made or are made open. The issue of openness is becoming more complex and wider while the attention on data is becoming more and more a business development asset.

Data ownership should be in the debate agenda of public administrations so to shape both a collective intelligence on the issue and a growing awareness on data relevance for the common good. To this purpose, the team has been following the work of other CAPSSI projects, such as DECODE[2]

4.2   Data Related Education

The growing relevance of public data and the lack of diffuse literacy ask for data literacy goals to be integrated in public agenda. Data disclosure cannot achieve an effective exploitation of the data value as long as it mainly benefits private agents having data utilization skills. This would only risk widening the gap on benefits between data driven businesses and the rest of the society. Data related education is fundamental to reduce the gap and transforming data, any data, into a commons equally benefiting the society.

Relevant to the educational aim is the domain of service design and creation. The creation of environments for data-driven services design can represent a relevant opportunity, as they are based on the commitment of involved actors to solve their problems by proposing new services; the relation between service production and data makes educational opportunities to flourish and data related education to be developed within an operational approach.

4.3   Data oriented urban policy

Many services are implemented and exploited in urban environments: several are actually functional to data collection rather than to service provision. This phenomenon is not new but is spreading faster and faster and asks for a strategic effort of public administration to conceive urban environments no longer as data production environments rather as data value exploitation for the common good. Policies are needed to transform the use of urban environments for data collection into creative platforms for data exploration and utilization to solve urban problems and urban daily life issues.

Policies are needed to guarantee bidirectional flows of data: from citizens to service suppliers and from service suppliers back to citizens for the benefit of the wider society. It is in the making of city, in the inner core of data production that a democratization of data utilization can be embedded and produce most effective and beneficial outcomes.

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[2] The DECODE project explore the issue of data ownership and provides tools for individuals to control their personal data. Although investigating on a different area (private data) the project is setting the ground for a thorough debate about data ownership

5   Hackathon campaigns as resources for transition

Not only have hackathons proved to be an effective format to collaboratively work on solutions while developing a more distributed awareness on the potentials of open data, the O4C hackathon process also allowed for better defining the problem space, particularly when the challenges are not easily 'hackathonable' yet. The elaborate O4C campaigns are complex but promising processes in dealing with societal challenges, so contributing to the giant, widespread global effort to address them.

These potentials are related to:
●   the strategic value of the challenge: although always having owners, challenges may be not be clearly related to societal challenges; therefore some of the challenges may be solved in a niche, others are activating regime changes.
●   the creation of a challenge-related ecosystem: relevant to the extent to which the creation of the ecosystem takes into account the governance of an-going transition in a specific context;
●   data as strategic resources to transition: in a period in which data seems to be the basic resource for business we also have to explore their potentials in contributing to the development of disruptive solutions.

5.1   Challenges having strategic values

Although many problems experienced by citizens are relevant as such (i.e. any citizen has a "right to challenge"), not all problems have the same capacity to contribute to addressing societal challenges. Some of them may be not shared enough and therefore represent weak opportunities for the adoption of strategic solutions especially when such solutions are supposed to contribute to societal challenges; similarly, some of them may represent very peripheral issues with respect to societal challenges and any solution to them may not have the disruptive and breaking potential required when dealing with societal challenges.

Relevant to this is the existence of intense, frequent public debates about societal challenges, to turn such challenges in public, collective values. This would allow citizens to mature a "right to challenge" well aware of some ineluctable societal priorities, which may help them to present re-frame their problems in relation to global issues.

Contexts with a mature culture of public debates and with a deep awareness of global urgent problems are most likely to give rise to initiatives exploring new answers, also by the use of data.

5.2   Challenge-related ecosystem as triggers towards transition

As it is experienced by the Open4Citizens project any hackathon campaign also aims at creating a challenge-related ecosystem which may be relevant to achieve wider, systemic changes. Achieving the creation of a determined and committed ecosystem is crucial to make the hackathon initiative a potential input, contribution, to a transition taking place in the specific context. This may depend on:

1) the fact that such ecosystems are generally composed by actors and institutions having different but strategic embedment in the local system and can guarantee a partial commitment of their organizations and institution to the adoption of the challenge as having a public/collective relevance;
2) the likelihood for the ecosystems created in a campaign to bridge the niche change (according to Geels' model) to broader changes at the regime level

Within this perspective it is important that actors and agents acting or governing at the level of regimes are open to dialogue and interact with the niches of innovation in order to guarantee more effective contribution to transition especially when they are clearly contributing to it in response to societal challenges.

5.3 Data as strategic resource towards transition

In keeping with Mulder and Loorbach (2018) who also studied co-creation processes in the context of societal transitions, we frame these challenges to reinvent our modern welfare society, its institutions and economy, as a collective societal design challenge. As the use of local data sources has proven to be valuable in the collective reframing of situated challenges, we advise the governmental bodies to benefit from the creative capacity that can be detached through participation in O4C campaigns, and organise collective design challenges also in the context of transition management, to frame the direction, purpose and theme of envisioned transitions. Participation of authority as data brokers and/or data curators is, however, key in these collaborative dialogues and to guide the transition dialogues in a meaningful way.

Creating an "open data community" is a vehicle for change in the city but it only works if both open data policies and participation policies are in place. Consequently, it will enable people to
a) understand the city though data
b) communicate with help of data (counteract "fake news" and populism - go to the source)
c) change the city with help of data.

An established Open Data Community is expected to become the ground for a creative development that will possibly give birth to a new generation of urban services (apps, services, physical transformation in the city and in the territory) based on the use of open data. This process of change can be catalysed by a design process that links emerging trends and initiatives, such as changes in policy making, new business models, new projects and a larger public awareness of the potential of open data.

6   Conclusions

The lesson learned from the O4C project elaborated in D2.1 Best Practices report, suggests that the policies to support a better use of open data would refer to a systemic change that includes the way data are made available and useable, as well as the development of a culture of working with data. This complexity requires policy initiatives that cannot be limited to a superficial action of education with data, but would rather concern the generation of creative environments, in which data literacy is acquired through operational and practical exercises, that involve wide groups of stakeholders in defining solutions for societal problems.

The O4C project started from the assumption that open data can be considered as a commons. The development of the project demonstrated that this is only possible by creating opportunities for wide participation of citizens and other relevant stakeholders. The question of promoting the use of open data is therefore related to the creation of communities of users and practices for designing with data. It implies a systemic change that is not far from becoming real, but could be appropriately boosted by initiatives that link the operational level (creating with data) with the organisational level (creating new services and infrastructure) and with the policy level (setting the appropriate governance framework).

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