# Web-COSI "Web COmmunities for Statistics for Social Innovation"

**www.webcosi.eu**

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**Web communities' engagement. Exploitation of new technologies for statistics. Web-COSI experience.**

**Partner in charge: ISTAT**

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**Deliverable 3.7**

**Web communities' engagement. Exploitation of new technologies for statistics.
Web-COSI experience.**

## Summary

This report, in charge of Istat – Web-COSI project coordinator, aims at giving an overview of Web-COSI experience conceived to deepen the complex "theme" of the involvement of Web communities for statistics and the exploitation of new technologies to construct better data, with particular attention to the new measurements beyond GDP. On a side the document provides a conceptual framework behind the project and on the other side reports the results/outcomes reached by the various activities carried out. Starting from a review of the state of art (mapping exercise) the document treats in a wider perspective the implications pointed out within the debate generated by the project to empower data and information with the involvement of Web communities using the opportunities given by Web2.0. The analysis is conducted considering the perspectives from the different key players to drive social innovation: the traditional ones - National Statistical Institutes (NSIs), Academia, researchers, International Organizations, Government agencies, etc, with new actors - civil society organizations, social entrepreneurs, and citizens at large. The dialogue among traditional and new stakeholders – permitted without boundaries by Internet – is the key element to joint efforts for a "better informed" and "conscious" society for a sustainable growth which puts Man and his Environment at the center of the individual and collective behaviors alongside the policy actions.

# Index

## 1. Introduction

This report illustrates the Web-COSI experience, *Web-Communities for Statistics for Social Innovation*, one of the ten CAPS project[4], funded by the FP7 2013 Working Programme by DG-CONNECT under the Collective Awareness Platforms for Sustainability and Social Innovation vision [13]. Web-COSI was designed with the aim to reach three main objectives: i) implement the engagement of society at large with statistics beyond GDP and to foster their understanding and usage; ii) map how digital initiatives function to engage citizens and involve communities to exploit on-line data; iii) implement tools for a better integration and complementarity of official and non-official statistics, exploiting the use of crowd-sourced data.

The two-year (2014-2015) action, now at its 21st month, is carried out by a Consortium led by Istat – the Italian National Statistical Institute ([www.istat.it](www.istat.it)) - with the partnership of OECD - Organisation for Economic Co-operation and Development ([www.oecd.org](www.oecd.org)), alongside Lunaria – an Italian Association for Social Promotion ([www.lunaria.org](www.lunaria.org)), and i-genius - a Social Entrepreneur Business and Enterprise Community in the UK ([www.i-genius.org](www.i-genius.org)). The four-partner Consortium sees the collaboration among two relevant institutions and two young NGOs an so composed naturally bridge the *top-down* and *bottom-up* approaches dealing with the construction of statistics.

The present document treats the theme of the involvement of Web communities for statistics focusing on the exploitation of new technologies for "better" data for Social Innovation.

Section 2 (*Setting the scene*) gives the general context in which Web-COSI is embedded. Since the beginning of the new millennium, the ICT explosion in conjunction with the "beyond GDP" movement is generating huge forces which are pushing to drive the individual and collective behaviour towards Social Innovation.

Against the above context, Section 3 (*Web-COSI: the conceptual framework and its work plan*) illustrates the conceptual framework within which the activities of the project have been developed. The framework identifies the various stakeholders (old and new) involved – each one with its role, needs and expectations - in the search of a dialogue to construct - via the knowledge given by information and data- a society "aware and conscious" of its possibilities (and limits) to drive individual and collective behaviour alongside policy actions for a sustainable societal growth.

Section 4 (*The involvement of different stakeholders for better statistics*), gives some key elements in the perspective from the various stakeholders on the exploitation of the potential of Web2.0 communities for statistics, with particular attention to beyond GDP data. Starting from the mapping exercise on the digital initiatives carried out, the sub-sections illustrate the main topics on the construction and usage of better statistics taking advantage of Web2.0 and report some remarkable application realized using Web2.0. Communities' involvement can be done indirectly, using the *liquid data* available in the Net (Big Data, Open Data -given by stakeholders citizens for a variety of reasons) and directly by the set-up of collaborative platforms voluntarily nursed by the stakeholders and citizens (crowd sourced data). To analyze the above topics and to collect key

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[4] See [https://ec.europa.eu/digital-agenda/en/collective-awareness-platforms-sustainability-and-social-innovation](https://ec.europa.eu/digital-agenda/en/collective-awareness-platforms-sustainability-and-social-innovation)

experiences on them, Web-COSI has interacted – through its activities[5]- with representatives of the different sectors of society – NSIs, government, research organizations, social enterprises, civil society, Academia, business world, young people, International Organizations, connecting with CAPS projects[6] and with other European and abroad projects[7] and through the participation in International and National Conferences and events[8]. The involvement of representatives of the European Statistical System (ESS), of EU DGs, and of Eurostat have been actively established to enlarge Web-COSI debate. It is worthy to underscore that the choice of grouping the key elements and result in the perspective from the various actors, permits an easier reading of the document even if it is necessary to consider that the different protagonists work jointly and their perspectives are noticeably and easily cross cutting among themselves.

Section 5 (*The young people involvement*), focus on the importance of the involvement of young people with statistics. On a side the new generations are particularly sensitive to be involved in what data and information say to push economic growth in terms of well-being for a sustainable societal progress close to their expectations on the future. On the other side young people are the ones who will contribute to construct new and better statistics thanks to their effort to be proactive using new skills and technologies. Web-COSI project is contributing on both sides with the set-up of a Youth Portal and of the Wikiprogress University Programme, that are illustrated pointing out the results reached so far and their potential.

Section 6 *(From the construction to the usage of beyond GDP statistics: policy use)*, faces the great matter of the policy use of beyond GDP statistics, representing a fundamental challenge (particularly) in this moment of economic (and political) crisis. Policy makers and opinion leaders have been used to measuring the progress dealing mainly with a unique data – the Gross Domestic Product. The beyond GDP vision implies to widen the view and to deal with a set of data and indicators that makes more "difficult" and "different" to take decisions.

In Section 7 (*Conclusions. Next steps*) some observations and insights on Web-COSI experience are illustrated underlining the points of strength, the open issues, and the further implications.

The debate generated by Web-COSI project is impressive and the results reached are notable showing a strong potential for a socio-economic impact and wider societal implications. An exhaustive documentation on the activities carried out and on their results is available on Web-COSI website (www.webcosi.eu).

The activities carried out have fully exploited Web2.0, using the Social Media channels, the project website, and the global platform Wikiprogress hosted by OECD (www.wikiprogress.org). The activities were announced through e-FrameNetwork (sponsored by EC within the FP7 e-Frame

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[5] The activities organised by Web-COSI as envisaged in its work plan are: 5 workshops, 4 focus groups, 4 on line discussions

[6] Web-COSI has worked with the CAPS projects, connecting directly with some of them and participating to the concertation meetings and the CAPS 2014 and 2015 Conferences organised by CAPS2020 project (www.caps2020.eu)

[7] In particular Web-COSI has taken into consideration the result of the SSH FP7 e-Frame project - *European Framework for Measuring Progress* (www.eframeproject.eu).

[8] Web-COSI has participated in many International and National Conferences to enlarge the discussion of its theme and to dialogue with representatives of various realities. In particular Web-COSI has participated in NTTS2015 Conference (http://www.cros-portal.eu/content/ntts-2015) and Q2014 Conference (http://www.q2014.at/home.html).

project) and via the portal of the European Statistical System (www.cros-portal.eu). All the face to face events organized have been live streamed in order to reach an audience as wider as possible.

The engagement of citizens and stakeholders reached so far by Web-COSI is really impressive. About *16.000 proactive participants and followers* of the activities carried out, and more than *1.500.000 people informed* on via the Social Media.

## 2. Setting the scene

Since the beginning of the new millennium the "theme" of the involvement of communities for statistics is dominating the scene of the research world. The process capitalizes on the two epochal revolutions that are characterizing the present phase.

On a side, the implementation of ICT that - with its new technologies - is giving huge new opportunities to produce and collect data via the NET, connecting people from different sectors of society without limits.

On the other side, the "beyond GDP" debate on the new measurements of well-being and sustainability that has become a global movement (supported by Web2.0).

The forces generated by ICT and beyond GDP debate push for a *conscious knowledge* towards Social Innovation[9].

**Involvement of Communities for Statistics**



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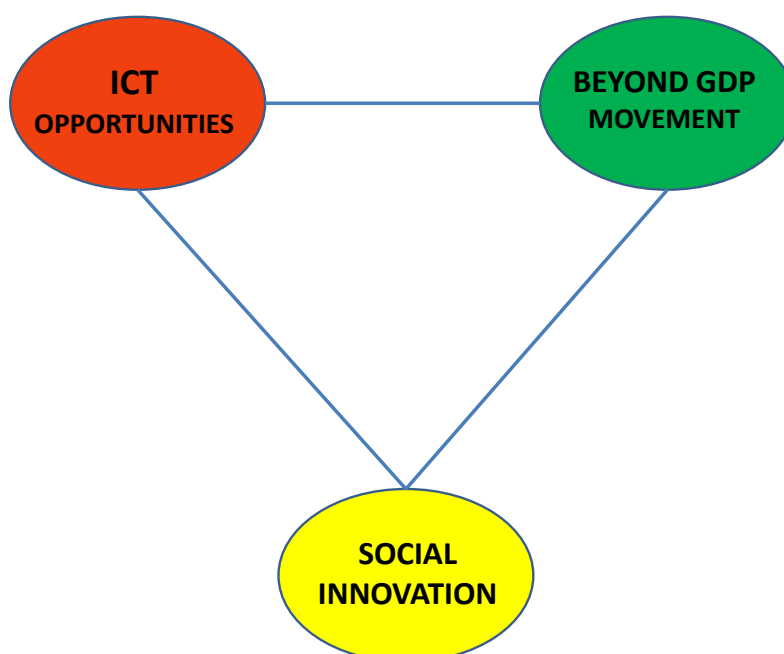
[9] The concept of Social innovation can be developed in the concept of Digital Social Innovation. See the DSI project supported by EC, led by NESTA, at http://www.nesta.org.uk/project/digital-social-innovation

*ICT revolution*

Over the last 15 years, Web2.0 applications are profoundly transforming the way information is created and shared and the way how to build up knowledge within the society at large. The process is having an increasing impact on statistics: from new ways of collecting data to new ways of disseminate, visualize and recover them. Online platforms and networks - founded on the interactivity - provide a measure of how the roles of producers and users of information and data can radically change and how the relationship is moving to bridge the *top-down* and *bottom-up* approaches.

This process brings to enlarge the traditional vision on how to construct and deal with statistics and data opening the dialogue among *experts* and new *non –expert forces* of the society. Moreover, Web 2.0 brings to the involvement of communities for the construction of better statistics considering new sources of data such as the *liquid data* available in the Net (Big Data, Open Data, crowd sourced data).

> *"New technologies are leading to an exponential increase in the volume and types of data available, creating unprecedented possibilities for informing and transforming society"*
>
> A world that counts[10]

*Beyond GDP movement*

In conjunction with the Internet explosion, the last 15 years have been characterized by the debate "GDP and beyond" pushing the research world to focus on the definition of new measurements of societal progress in terms of well-being and sustainability. The debate, thanks also to Internet, has grown enormously creating a critical mass without boundaries at local, national and international level. Alongside the traditional stakeholders, citizens and communities are involved in the discussion willing to give their voices about the need to go beyond GDP to narrow the gap between what *cold* economic data say and what people perceive in terms of quality of life related to societal progress and sustainability.

The beyond GDP debate has been carried out by a number of International initiatives representing the pillars for the theoretical and applied research carried out so far. In 2003 the European Commission gave a strong impulse to study new statistics beyond GDP with its Directive on the re-use of public sector information [1]. The World Forums (Palermo 2004, Istanbul 2007, Busan 2009, New Delhi 2012)[11] organized by the Organization for Economic Co-operation and Development (OECD) contributed to open the discussion in a global dimension. In 2008 the very famous Stiglitz-Sen-Fitoussi Commission was set up to move "beyond GDP" in a concrete way. The final report stressed the necessity to move the attention from measuring economic production to measuring individual well-being, thereby identifying the limits of GDP as an indicator of a "real" economic

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[10] *A world that counts*, prepared by The Independent Expert Advisory Group on a Data Revolution for Sustainable Development (IEAG), chaired by Enrico Giovannini, November 2014 (www.undatarevolution.org)

[11] The next 5th OECD World Forum on Statistics Knowledge and Policy will be held in Guadalajara, Mexico, 13-15 October 2015

performance and societal progress. In 2009 the European Statistical System Committee established the Sponsorship Group on 'Measuring Progress, Well-being and Sustainable Development' with the aim of translating the recommendations of the Stiglitz-Sen-Fitoussi Commission into concrete actions in charge of the National Statistical Institutes (NSIs), calling on them to push the definition of sound and timely statistics, thus implying a better use of all the available statistics and developing new statistics and concise indicators. In its final report [4] the Sponsorship Group outlined a strategy to develop statistical information to meet the Stiglitz's Commission recommendations, pointing out the development of better statistics related to: 1) household perspective and distributional aspects of income, consumption and wealth; 2) multidimensional measures of quality of life; 3) environmental sustainability.

Over time, numerous European initiatives have been set up to enlarge the community engagement in the discussion in order to share knowledge, information and data on measuring progress in a bottom-up approach.

On the side of the EU NSIs, in order to develop new official statistics "beyond GDP", stakeholder's consultations and discussions with society at large are currently carried out. The Italian National Institute of Statistics (ISTAT) has instituted the CNEL-ISTAT initiative for measuring Equitable and Sustainable Well-being in Italy "BES" (www.misuredelbenessere.it). BES has been carried out a deliberative process for the definition of a theoretical framework for the measurement of well-being and the selection of the indicators which are composing it. The result of the consultation has provided a set of indicators, as a decision co-established by Italian society at large, on which the methodological and technical research is going to build up its activities. Other notable initiatives have been carried out by the Office for National Statistics (UK) for the construction on new indicators beyond GDP and for fostering the involvement of communities for their understanding and usage (www.ons.gov.uk).

A notable bottom-up initiative set up by the OECD is the Better Life Index launched in 2012 [11]. This is an interactive tool that allows users to compare well-being across countries, based on 11 topics identified as essential, in the areas of material living conditions and quality of life. Moreover, the Regional Well-Being website – set up in 2014 - allows to measure well-being in specific community and compare it with 361 other regions.

The Beyond GDP debate carried so far, through the initiatives briefly summarized above, has reached some stable points on the meaning of new indicators for well-being, societal progress and sustainability. NSIs alongside influential International actors (OECD, UNECE, etc.) and other relevant partners from Academia and the research world, are broadly converging in terms of methodology and techniques for an integrated framework of measures beyond GDP.

More recent European projects and initiatives are deepening some issues to foster the construction of better statistics beyond GDP responding to the request made by the civil society and the citizens to be actors in the definition of the new measures. Many projects deals with the exploitation of Web2.0 opportunities in these perspective. Non-traditional sources of data available in the Net (Big Data, Open Data and crowd sourced data) can represent precious sources of information and data to strengthen the construction, the usage and the understanding of the new indicators beyond GDP.

Against this framework, among the multiple initiatives recently carried out at European level, it stands Web-COSI project - ***Web Communities for Statistics for Social Innovation***, to explore the potential of Web2.0 communities for statistics beyond GDP - willing to give its contribution in an era of "*data revolution*" [12].

## 3. Web-COSI: the conceptual framework and its work plan

Against the above context, Web-COSI coordination action, *Web Communities for Statistics for Social Innovation* (now at its 21st month of activity), is based on a conceptual framework synthetically represented by the following chart:
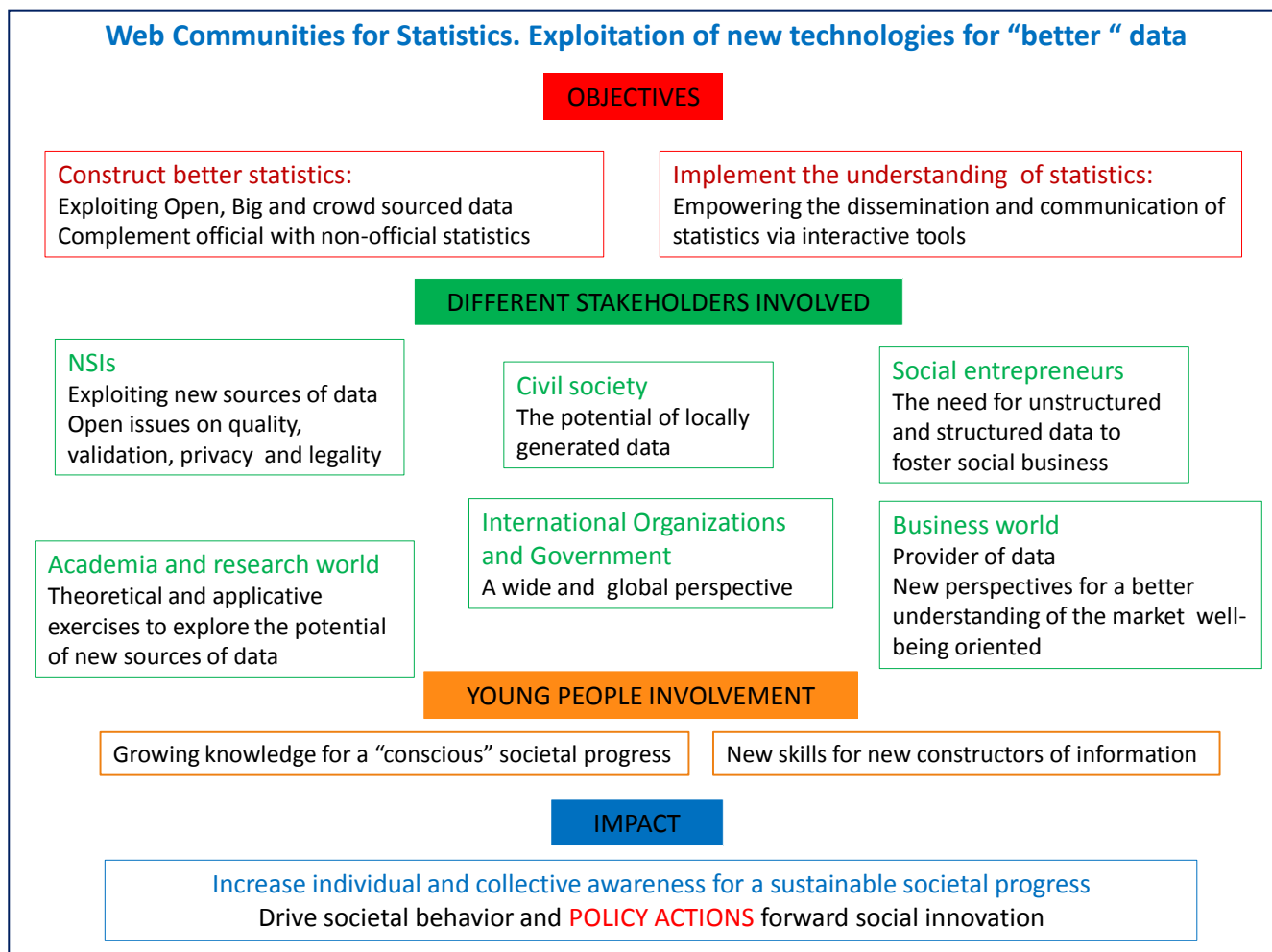


The starting point for Web-COSI's involvement of communities for statistics is the need to reach ***two main objectives***:

1) strengthen the engagement of society at large with statistics beyond GDP to foster their understanding and usage;
2) push for a better integration and complementarity of official and non-official statistics, exploiting the use of crowd sourced data to construct better statistics.

At this aim, the activities carried out by Web-COSI can be gathered into four groups:

1) map the existing digital initiatives for communities' involvement with statistics beyond GDP and for the exploitation of new technologies to collect "better" data, carried out by the various actors at local, National and global level;

2) foster the debate and create a critical mass through digital initiatives (blogs, on line discussions, webinars, newsletters, target citizens campaigns, data visualization competitions), organization of face to face events (workshops, seminars and focus groups) and participation in International and National events networking with other projects and stakeholders ;

3) foster the engagement of young people through the setup of target initiatives (a European Wikiprogress University Programme and a Youth portal);

4) facilitate the communities' access to statistics empowering the collection of locally generated information and data with the development of a Wiki data portal of progress statistics.

Following the conceptual framework, Web-COSI has led its activities interacting with *different stakeholders (old and new) involved* - each one with its role, needs and expectations - in the search of a dialogue to construct a "better informed" society.

These various actors involved see the theme from different perspectives.

The NSIs, the historical producers of official statistics, are now called to exploit new sources of data (Big, Open, crowd sourced) interacting with citizens to involve them in the process of defining statistics close to their information needs and with the aim to make statistics easy to access and use. This process leads to face enormous issues on the quality, validation and integration of non-official data with official data [7]. It opens the door to a new way of being an NSI, capable to take advantage of the *liquid data* available in the Net generated by a diversity of providers (public and private) as well as locally generated by crowd sourced platforms.

The Academia, under the aegis of the EC, UNECE and other International Organizations, such as OECD, are involved, jointly with the NSIs and the research world, in theoretical studies and applicative exercises to explore the potential of the new sources of data (text mining, text grasping, open data linkage, geo-referenced data).

A crucial and well-established actor for the definition of better statistics beyond GDP is the civil society. The NGOs are proactive protagonists in the search of more exhaustive way of making data with the aim to exploit the potential of locally generated data to create a critical mass to drive the policy action for a societal progress beyond GDP.

Social entrepreneurship is an emerging force which is becoming a more and more important stakeholder to drive the economy for a sustainable societal growth. The need of structured and

unstructured data is fundamental to foster the social business which carries out so many divers ventures dealing with global, national and local matters.

International Organizations and Governments are fully involved into the debate of new ways of collecting data and information interacting with communities and exploiting the data available in Internet. They have a wide perspective to permit comparisons at National and global level.

The business world is dealing with this new way of making data in different perspectives. On a side the "ICT market" such as Google, Facebook, and other important private Social Platforms can be seen as provider of the data collected for its use and useful to construct statistics. On the other side the business market has to deal with the new statistics (beyond GDP) in order to read the citizens as conscious consumers to treat no longer with a merely profit approach.

Besides these new and old stakeholders, it is fundamental to pay particular attention to the *young people involvement* with statistics. On a side young people are the ones who strongly can give their voices using Web2.0 to path the way for a better informed society for a good future. On the other side the young people have to be educated for the new skills needed to construct better statistics.

Moreover, it is crucial to focus on the usage of beyond GDP statistics by *policy makers*. It is a hard way to go ahead. But now society at large can contribute to steer the policy actions for well-being and sustainable societal progress thanks to the increasing individual and collective awareness nursed by Internet.

Finally, the expected *impact* of the Involvement of Web Communities for Statistics is to construct - via the knowledge given by information and data - a society "aware and conscious" of its possibilities (and limits) to drive individual and collective behavior alongside policy actions for a sustainable societal growth.

## 4. The involvement of different stakeholders for better statistics

In the data revolution era the huge development of digital technologies has completely redefined the way people interact with data, expanding the range of data sources available and making statistical data and information a key driver for knowledge, societal progress and innovation. The amount of data that is generally available is growing exponentially thanks to the incredibly fast development of IT tools. Being available in many formats such as traditional gathering, video, audio, social networking sites, purchase transactions, the data are characterised by a great variety implying big problems with regard to their analysis. This phenomenon has led to the massive production of liquid data − big, open and crowd sourced data − that are mainly large in number, often unstructured datasets available potentially in real time.

Different stakeholders are involved to get the best from these new sources of data by exploiting Web2.0 opportunities and many of them are working to make data becoming a resource for the achievement of sustainable societal progress and innovation.

Web-COSI has been capable of conceptualising and giving a clear systematisation to the factors at the basis of the current process characterised by data revolution. It has contributed to recognise the

main actors of this process, defining their role with the final aim of fostering citizen engagement with well-being statistics through the use of digital technology.

Project activities have involved people in the development of well-being frameworks, providing opportunities to share knowledge (e.g. on-line discussions, workshops, webinar, social media). The project has the great merit of having given a strong impulse to all the stakeholders involved, making them aware of the on-going above mentioned process and of the opportunities offered by Web2.0 technologies. Web-COSI has worked to facilitate the access to the findings and analysis of data and to engage people as data producers themselves, complementing a traditional top-down approach to statistics with a new bottom-up approach. To this effect, the project has implemented the concept of engaging the society at large to foster progress and well-being, through the realisation of the Wiki of Progress Statistics [8], a new data-sharing portal on the Wikiprogress platform (hosted by OECD)[12] that allows users to access, upload and share data in various formats and different structures, finding solutions for a better integration of official and non-official measures of well-being and progress

### *The Web-COSI mapping exercise*

In the same context, the mapping exercise [14] carried out within Web-COSI activities has contributed to identify some of the key initiatives being undertaken by the various actors to engage citizens with well-being and societal progress data, helping to conceptualise the role of the different actors involved and to identify key challenges and open issues.

The mapping exercise has developed an interactive inventory of organisations and initiatives working with well-being and progress measurement, listing a large number of Web2.0 initiatives carried out by civil society, social entrepreneurs, NSIs, Governments and International organisations, interacting with citizens to share information and data, and combining top-down with bottom-up approach. It emerges that, thanks to the opportunities provided by digital technology, the ways citizens can be involved in the process of measuring well-being and societal progress have multiplied: citizens can be collectors, interpreters, communicators, developers, and informed users of different types of data.

The analysis has identified three main groups of digital initiatives for engaging citizens with well-being statistics:

1) Communication initiatives

Digital technology can provide information in a much more innovative manner. Finding innovative ways to communicate is a powerful way of making statistics more accessible to a broader audience. This can be done by the data producers themselves or by intermediaries.

2) Crowd sourcing initiatives

Crowd-sourced generated data empowers people to be *producers* as well as consumers of data and thus can be considered the ultimate in the democratisation of data and necessary in the context of the data revolution. Some concerns are represented by quality issues of data and the circumstances

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12 The Wikiprogress platform was launched at the 3rd OECD World Forum on "Statistics, Knowledge and Policy" held in Busan, Korea in 2009. It is an open source global platform that allows users to generate contents by developing information and data. It counts 30,000 subscribers and about 20,000 monthly visits.

that crowed-sourcing data means seeking out information from people motivated to provide that information, thus data can be statistically biased.

3) Open data initiatives

Open data are data that people are free to use, re-use and redistribute without any legal, technological or social restriction. However, while opening up access to data empower citizens, not everyone has the necessary skills or time to make the most of raw data. Therefore, there is the need to build capacity among citizens and to provide data in a format which maximises its potential to be accessed and re-used by citizens.
The mapping exercise has showed a broad need to combat digital exclusion and to build up capacity in marginalised groups (e.g. the young, the elderly, the poor, and low-skilled).

Thanks to the efforts of conceptualisation made within Web-COSI project through the mapping exercise, the reporting activity and the issues stemmed from various events and on-line discussions, it is clear that the different stakeholders involved are more and more searching for new and efficient ways of making use of on-line data. These stakeholders – NSIs, civil society, social entrepreneurs, international organisations, government agencies, academia, research and business world – together with society at large, are potentially becoming collectors, interpreters, communicators, developers, and informed data users in a larger well-being and sustainable progress perspective.

In the following sub-sections some hints about the different stakeholders' role will be illustrated. It will be done capitalizing on the work done by Web-COSI (already illustrated in the reports delivered by the partners) and taking into consideration some new more recent experiences presented at International events in particular the NTTS2015 Conference [5].

### 4.1. National Statistical Institutes' experience in exploiting new data sources

In the last years, thanks to the development of Web 2.0 tools that have opened many opportunities for statisticians, most NSIs have been carrying out research activities in the field of exploiting the opportunities given by digital technologies for the modernisation of official statistics production and dissemination processes and also to foster the interaction with citizens. A review of the multiple efforts carried out by NSIs is given in the report on "*The involvement of communities for statistics: National Statistical Institutes' experiences*" delivered by Istat in April 2014 [6].

As for the dissemination process, the use of social networks and interactive visualisation tools by NSIs have increased the access to statistics by a broader range of not specialised users, disseminating data in a more friendly way. While the official website (with its tools, data warehouses, archives of data and other material) remains the main dissemination channel, the other tools surely can offer a new dimension to communication by fostering real-time exchanges in locations often visited by the audiences.
Within this field, important efforts have been done to foster the production of well-being statistics. To this end, it is worth mentioning two important European initiatives, the "UK interactive measures of national well-being"[13], developed by the Office for National Statistics, and "How's

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13 http://www.neighbourhood.statistics.gov.uk/HTMLDocs/dvc146/wrapper.html

Austria?"[14], developed by Statistics Austria. By means of sophisticated visualisation techniques, they both allow users to select the dimensions of progress and well-being they are most interested in. In this sense, these initiatives represent an important step forward the involvement of society at large in the construction of personalised indicators to get information on what matters to people.

With regard to the use of liquid data (big, open and crowd sourced data), all NSIs recognise their impact on the statistical production process and many of them are investigating the potentialities and the challenges of using this kind of data as new sources. NSIs experiences with liquid data and crowd sourced initiatives clearly show that these issues are a very recent on-going process which is completely new and still not completely exploited.

*Big data challenges*

Big data are very interesting sources of information, however extracting this information can be challenging for many reasons and certainly this is even more demanding when big data have to be used to produce official statistics. Within the European Statistical System, in 2014 Eurostat recognised the importance of this issue, organising the "Big Data in Official Statistics" event in Rome [3], with the aim to discuss the current situation and the open issues on the matter, providing recommendations for the way ahead in the promotion of the use of big data for the production of European statistics. In addition to that, many sessions of NTTS2015 Conference in Brussels were devoted to big data issues, such as web scraping techniques, privacy and accessibility, linkage of open data and assessment.

From a methodological point of view, many NSIs are investigating new techniques to use big data both in a supplementary or complementary way for official statistics[15]. In terms of timeliness and frequency, statistics based on big data can supplement official statistics of very low frequency, and their geographical coverage can be greater than a single country. Moreover, big data are generated without the intervention of human reporting and thus can reduce the burden imposed on individuals and enterprises.

However, big data can implement concepts and information different from those required by the corresponding official statistics and thus need adjustment or combination with additional sources. Furthermore, big data sets can be not representative of the target population as they are selective by nature and thus they can provide biased results. Additionally, the use of big data as an additional source for official statistics requires a cost-efficiency analysis for two main reasons. Form one side, they can be available only via private intermediaries who may charge for the access, from the other one, high costs for processing them are needed. Moreover, the management of privacy risk related to the use of big data is a crucial question, as NSIs have to balance between providing access to data for the society benefit and accomplish society's expectation that sensitive information about data providers will be kept private.

Certainly, the great potential of big data can be exploited only developing appropriate tailored methods to accelerate the analysis of large amounts of data and investing in research and skills. To

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14 http://www.statsblogs.com/2012/11/27/hows-austria/

15 M. Petrakos, A. Santourian, G. Farmakis, P. Stavropoulos, G. Oikonomopoulou, E. Ntakou, A. Trampeli, and M. Koumaki (2015), "Analysis of the potential of selected Big Data repositories as data sources for official statistics", NTTS2015 Conference, Brussels.

this effect, NSIs and research centres are investigating on software tools and infrastructures that allow to manage the size and complexity of big data sources[16] and on platforms that provides a real-time exploitation of large data sets and allow the integration of new data analytics algorithms[17]. Finally, with regard to access issues, NSIs, jointly with research institutes, are exploring the possibility to use the experience and the knowledge of Research Data Centres when dealing with access to big data sources[18].

*UK Office for National Statistics Big Data Project*

An important recent example of a policy based on a global approach on big data is the work the UK NSI (ONS) is doing to establish his own policy on big data and longer term strategy incorporating ONS position within Government and internationally[19]. The main challenge around the use of big data within government is to maximise benefits to the public while protecting the privacy of individuals. This policy pulls together a set of principles designed to deal with the new aspects of using big data, such as legal and ethical issues associated with commercial data and data sourced from the web, together with long-standing principles to create a comprehensive policy with supporting guidance. An important aspect of the project is the stakeholders' involvement: the collaboration with UNECE project, ESS task force, Academia, private sector, Government and privacy groups have been strengthened to liaise with actors deeply interested in developing the use of big data, taking into account the different level of interest given by commercial, privacy, research or innovation reasons.

Some examples of the tools developed by the Big Data Project are the use of: web scraping to collect data on prices; Twitter as a producer of geo-located data to provide fresh insights into internal migration within the UK; smart meters to know the consumption of either electric, gas or water in the UK to identify unoccupied households to create efficiencies within a census or survey operation; location data generated through mobile phone usage to inform on population flows for comparison with 2011 Census travel to work flows.

The key conclusions drawn from the Project are that there are real tangible benefits in the use of big data and associated technologies within official statistics to create efficiencies and improve quality, produce new or complimentary outputs and improve operational processes. Therefore NSIs have a critical role to play to support the use of big data and associated technologies across Governments. Moreover, legal and ethical challenges associated with the use of big data within official statistics together with human and financial resources have to be seriously taken into account.

## 4.2. Civil society's initiatives to boost societal progress

Nowadays, the systemic complexity of society, characterised by social, economic, technological and environmental interdependence, makes even more important to know, interpret and share

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[16] P. Rey del Castillo and V. M. Lázaro Toribio (2015), "An exercise in producing flows statistics from big data sources" NTTS2015 Conference, Brussels.

[17] A. Marty, F. Cotton, K. Gadouche and N. Guédria (2015), "CASD-TERALAB, a secure remote access system to confidential Big Data: description, demonstration and use cases", NTTS2015 Conference, Brussels.

[18] D. Schiller and A. Burghardt (2015), "Using Research Data Centres (RDCs) to access Big Data", NTTS2015 Conference, Brussels.

[19] J. Naylor, N. Swier, S. Williams, (2015), ONS, "The Office for National Statistics – Big Data Project", NTTS2015 Conference, Brussels.

statistical data and information on people's well-being. This general context entails a growing role and importance of citizens that, thanks to the new technologies, is becoming active in well-being assessment and promotion. This process is willing to lead to fully informed and forward-looking policy choices, common ends and close collaboration between public institutions and civil society, democratic participation and community building for active citizens. To be able to think, discuss and act, citizens need proper tools – the new technologies and the possibility to exploit digital data – to reach awareness and knowledge.

In the last decade, many organisations and networks have played a seminal role in terms of raising awareness, stimulating debate in public and institutional spheres, engaging social participation, sharing information, and producing innovative set of data and indicators on well-being. Among these, the Civil society organisations (CSOs) play an important role on well-being by providing tools and methods for data gathering and visualisation, elaborating statistical indexes, using Web2.0 technologies and creating smart communities of data providers and data users. To this end, these actors have invested their social and scientific resources and skills such as public advocacy, consultation, direct cooperation with institutional bodies like NSIs. This kind of contribution is particularly effective at the sub-national level, where many organisations and CSOs are active in the territory on a number of different well-being related issues. In this sense, citizens can valuably contribute to the improvement of the quality of public services throughout local communities and territories. Citizens and CSOs thus become a fundamental resource for democracy, playing an active role in society and, for this reason, should have the opportunity to participate in everyday policy-making in a fully informed way, being able to defend fundamental rights and take care of common goods. Citizens are public services users and, at the same time, become providers of information on the functioning, condition and performance of public services, impacting directly on fundamental topics connected to people's well-being.

Civil society actors collect and disseminate a large amount of statistical data and information on well-being which should be better disclosed and valued. Even if the production of civic data and information may not have true statistical value, nevertheless it provides a major source of first-hand information which can be at any time exploited. CSOs and official statistics providers are called to further consolidate and strengthen their interaction in order to broaden the participation to the central process of defining what should be measured and what should really count in terms of well-being and quality of life.

In this context, the availability of the data produced by public institutions and CSOs should be as open, reliable and understandable as possible. In particular, the open data are crucial tools through which citizens may at any time evaluate if and how projects under their interest meet their needs, and whether financial resources are allocated effectively. Open data thus appear to be strictly linked to two well-being keywords: public transparency and participation. In this sense, a civic use of open data entails that citizens may experiment a closer collaboration with public institutions, monitoring the ways public money are concretely used.

It is worth citing the experience carried out by Monithon[20], that is an Italian civil society independent initiative based on an on-going civic monitoring of projects publicly funded. In particular, Monithon asks involvement of citizens to engage with the open data on projects and on beneficiaries of funds released by the Italian government and to produce valuable information through it, refining and detailing the one already provided by government institutions. Another

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[20] http://www.monithon.it

important example of CSO engaged in the use of open data for transparency is Dataninja[21]. It is an Italian informal network of data journalists, data analysts and civic activists that share competences and projects, covering several thematic areas (economy, politics, social phenomena) and using the most advanced ICT techniques in order to acquire, analyse, narrate and visualise data. Finally, a brilliant initiative devoted to involve citizens is Code for America[22] that builds open source technology and organise a network of people dedicated to making government services simple, effective, and easy to use, using personal skills to make the community better. A major scope of Code for America is to further develop a network of initiatives all around the world to promote civil actions at a national level[23].

Under this perspective, public data have therefore to be seen as a common good that should be shared with and participated by everyone. In their turn, public authorities in charge of the implementation of projects can take major advantages of an in-depth, real time civic feedback, integrating the accurate information provided by civic monitoring initiatives in ex-ante, on-going and ex-post assessment of funded projects. The positive outcomes in terms of renovation and re-legitimisation of the relationship between citizens and institutions are evident [18].

The increasing involvement of citizens as active actors in public decision-making processes, thanks also to the development of digital technologies, can be feasible if accompanied by a widespread digital literacy, which give individuals the tools for empowerment, regardless of age or socioeconomic and cultural background. Given the rapidity in the evolution of digital technologies, lifelong learning policies and programs aimed at digital literacy and targeted in particular to the less advantaged social groups play a crucial role, and must be widely enacted and enhanced by policy makers at all territorial scales [19].

Finally, policy makers and public institutions are called to enact appropriate laws which enable the availability and free use of open data, and carefully monitor full application of these laws within the administrations.

### 4.3. Social entrepreneurs' emerging role

A social enterprise is a company which mainly aims at social objectives (environment, human rights, health, equal opportunities,…) and reinvests its profits towards social goals, within the company or the community, rather than maximising profit for the benefit of its shareholders or owners. The role of social entrepreneurs is fully recognised at a European level, so that Europe2020 strategy is pushing to create a favourable climate for social enterprises considered as key stakeholders within the European policies devoted to societal progress and innovation. In this context, digital technologies and liquid data are key factors for the development of social enterprises. Even if SE could benefit hugely from data, it still faces a number of core questions: access, usefulness, representativeness, privacy and safety. SE desperately need to use data better and multiply its impact, but they rarely have the skills or infrastructure to do so effectively.

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[21] http://www.dataninja.it/

[22] http://www.codeforamerica.org/

[23] See for instance Code for Germany (http://codefor.de/), presented during the Web-COSI "Workshop on Using Technology to Engage Citizens with Well-being Statistics", held in Paris on September 2014.

The analysis carried out within Web-COSI project [10] has pointed out that SE are potential great users of data mostly in relation to the main steps which characterise their activity:

1. Get started, establish their initiative, need of data on the citizens' problems and needs
2. Foster their venture
3. Measure impact of social ventures
4. Communicate their activities and measure the overall phenomenon of social entrepreneurship.

### *Get started, establish SE initiative, need of data on the citizens' problems and needs*

The activity of a SE starts with identifying social problems that can be solved through the creation of a social venture. In this step statistics become particularly relevant as SE try to better understand the nature of the problem they are addressing and what resources may be accessible. However, start-up SE tend to rely less on data than established social businesses because they may have limited capacity to undertake research or have limited time to analyse existing data sources. Moreover, for many social entrepreneurs, the urge to set up a venture is driven by a passionate desire to address a problem which they would undertake with or without the support of data. Where data is used, rather than being a determining factor on whether to start the social business, it tends to be applied often to attract other resources such as finance or people support, proving that a need exists or that it can be effectively addressed. Often SE will leave detailed analysis for a later stage when they have more resources to utilise such data. Where statistics are not available, SE have to produce their own or to outsource data collection and analysis.

### *Foster SE venture*

The usage of data by SE covers almost every period of the lifecycle of a typical business. Once the social enterprise is established new factors become important, such as raising more sophisticated finance (e.g., investment rather than smaller loans), expanding the size of the team (senior management, employees), conducting market research to better understand the market in which they operate, measuring social media or other audience activity, campaigning.

### *Measure impact of social ventures*

This is deemed the most important purpose for using statistics by SE. In fact, the need to measure impact most distinguishes social entrepreneurs from mainstream purely commercial entrepreneurs. Proving its social benefit is the very reason for the existence of a social venture. Becoming the measuring of social impact more sophisticated and mechanised, it is an essential tool for funders, customers, beneficiary community, and employees, to assess the overall value of the venture.

### *Communicate SE activities and measure the overall phenomenon of social entrepreneurship*

This aspect is particularly relevant to policy makers and corporations or think tanks/academics who engage directly or indirectly on social entrepreneurship. It is relevant in areas such as assessing the sustainability of social businesses in terms of employment, prosperity, or even survival rates. What motivates social entrepreneurs, and how customers, communities and citizens view social businesses are amongst the many important factors which govern related policy decisions. The development of good policy and an effective overall eco-system is of great importance to social entrepreneurs.

*The survey on SE's usage of data and statistics*

The results from the survey [9] conducted within Web-COSI project on April 2015 are very interesting. Most of the social entrepreneurs interviewed deem statistics very important to their work, so that most of them make use of both official and non-official statistics coming from think tanks and NGOs. However, a great number of SE usually produce and use their own data.

It is important to notice that SE are often closer to their market or the social problem they are trying to address than policy makers or other authorities. Therefore, this viewpoint gives them a unique perspective in the interpretation of data and the production of their data is usually finely attuned to measuring impact and solving specific problems.

Moreover, the majority of them expect their usage of statistics to increase over the next few years and their usage of such data would be likely to change, due to many factors: the growth of the SE sector, the complexity of the integrated project they are going to implement, the fact that social enterprising is in a process of institutionalisation, the importance of evidence based policies and the growing of data-driven businesses, the necessity to go in a more detailed insight in certain trends, the necessity of forecasting and measuring the impact of their activity.

Data visualisation is vitally important in enhancing the understanding of data and the involvement in their usage. As SE usually lack time and resources to provide data to a consistent high level, they should be easily enabled to partner with analysts, and more awareness on how to access existing open source platforms. There is a greater need for multi-party players such as universities, think tanks and governments to co-ordinate their activities and engage social entrepreneurs in the gathering and interpretation of data, also to provide greater trust around the data produced.

Additionally, the usage of data by SE is in most cases less commercially sensitive than mainstream businesses whose data usage may be mainly for market advantage rather than combating a social problem.

Social entrepreneurship is a relatively new concept in the arena of public policy. A move towards a more common language and definition or even glossary would help speed the interpretation of statistics and help wider public understanding. Finally, enhanced awareness amongst policy makers is important and they should be encouraged to measure indirect impact of social entrepreneurship on related issues such as job creation, efficient use of capital, wealth distribution and on wider concepts such as happiness and volunteering as well.

4.4. International organisations' coordination role

The international activities on the use of digital data for statistics for social innovation play an important role from one side, in driving national initiatives, from the other, in coordinating the on-going actions to share best practices and to face common issues. Any collaboration and test made sharing experiences and results at an international level show that putting together capabilities and exchanging results achieved allow to improve the potential of big data sources, exploiting new IT tools, new methodologies and peculiar skills that would be difficult to find and use at a national level. The following examples represent two important initiatives, one in the field of the use of big data for better statistics, the other, a great visualisation and interactive effort to involve citizens in well-being debate.

The UNECE High-Level Group for the Modernisation of Statistical Production and Services[24] is developing the Big Data Project that concerns the role of big data in the modernisation of official statistical production. The project comprised four task teams, addressing different aspects of big data issues relevant for official statistics: the Privacy Task Team, the Partnerships Task Team, the Sandbox Task Team and the Quality Task Team.

As for privacy, it is very carefully handled in terms of legal constraints, representing a key issue. This Task Team has developed a number of guidelines[25] for risk treatment in view of privacy issues that build both on existing tools and on more novel ones. These guidelines have been divided into three main groups of issues: information integration and governance; statistical disclosure limitation/control; managing potential risk to reputation.

The Partnerships Task Team is working to identify and review partnership models with data providers, sources and organisations such as academia, scientific communities, research institutes, and technology providers, to develop big data standards, processes and methodologies.

With regard to the "Sandbox"[26], a web-accessible environment for the storage and analysis of large-scale datasets has been created and used as a platform for collaboration across participating institutions. It provides a technical platform to load big data sets and tools, with the goal of exploring the tools and methods needed for statistical production and the feasibility of producing big data-derived statistics and replicating outputs across countries. Some testing performance of big data tools have been made using price data recorded by point of sales in supermarket (scanner data), data from telecom providers for statistics on tourism and daily commuting, data collected from smart meters reading for statistics on power consumptions, data from traffic loops installed on roads for traffic statistics, Twitter data for analysing sentiment and detect touristic activity, job advertisements published on web portals for statistics on job vacancies, and collecting data from the web (web scraping).

The quality, in terms of coverage and representativeness, is another crucial theme that need to be carefully tackled. The quality Task Team[27] has identified a complete quality framework for big data with additional dimensions and principles providing a structured view of quality at three macro-phases of the business process: input, throughput and output.

The OECD is committed in using big data for better statistics on well-being.

The OECD Wikiprogress[28] is a global platform for sharing information in order to evaluate social, environmental and economic progress. It is open to all members and communities for contribution – students and researchers, civil society organisations, governmental and intergovernmental organisations, multilateral institutions, businesses, statistical offices, community organisations and individuals – to anyone who has an interest in the concept of "progress". The crowd-sourced interactive platform was launched in 2009 at the OECD World Forum on Statistics, Knowledge and Policy in Busan, Korea.

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[24] http://www1.unece.org/stat/platform/display/bigdata/Big+Data+Projects
[25] Task Team on Big Data Privacy, (2015), "A suggested framework for National Statistical Offices for assessing and managing Privacy Risks related to the use of Big Data", NTTS2015 Conference, Brussels.
[26] M. Jug, C. Vaccari, A. Virgillito, (2015), "A shared computation environment for international cooperation on big data", NTTS2015 Conference, Brussels.
[27] Task Team on Big Data Quality, (2015), "A suggested framework for National Statistical Offices for assessing the Quality of Big Data", NTTS2015 Conference, Brussels.
[28] http://www.wikiprogress.org/index.php/Main_Page

Launched in May 2011, the OECD Better Life Initiative is a first attempt to bring together internationally comparable measures of well-being in line with the recommendations of the Commission on the Measurement of Economic Performance and Social Progress (the Stiglitz-Sen-Fitoussi Commission). The recommendations made by this Commission sought to address concerns that standard macroeconomic statistics like GDP failed to give a true account of people's current and future well-being. The OECD Better Life Initiative includes two main elements: "Your Better Life Index" and "How's Life?". Your Better Life Index (BLI), including 11 dimensions of well-being, is an interactive tool that allows people to compare countries' performances according to their own preferences in terms of what makes for a better life. "How's Life?" offers a comprehensive picture of what makes up people's lives in 40 countries worldwide. The report assesses the above 11 specific aspects of life as part of the OECD's ongoing effort to devise new measures for assessing well-being that go beyond GDP.

### 4.5. Government agencies and the use of big government datasets

All over the word many government agencies are active in implementing open data initiatives for enhanced access and more effective use of public sector information. To cite just some examples, the UK Government, in the spirit of the Freedom of Information Act, recently launched a website[29] where all public information is to be presented in a computer-readable and easily accessible format. In the US, President Obama signed an executive order in his first term, calling on all federal agencies to standardise and publicise available datasets and make it easier to find and analyse government[30]. The European Commission's work in the area of open data[31] is focussing on generating value through re-use of a government data, that is all the information that public bodies produce, collect or pay for, e.g.: geographical information, statistics, weather data, data from publicly funded research projects, digitised books from libraries. EC supports open data for four reasons: 1) public data has significant potential for re-use in new products and services; 2) the availability of open data can help to address societal challenges providing new and innovative solutions; 3) open data allows to achieve efficiency gains through sharing data inside and between public administrations; 4) open data can foster the participation of citizens in political and social life and increase transparency of government.

On this matter the OECD has conducted an interesting study [17] that, after having analysed the various OGD (Open Government Data) portals, proliferated since the mid-2000s both at central and local government levels, suggests a methodology to analyse and prove the impact and accrued value of the numerous initiatives. In details, using an analytical framework for OGD initiatives (to be applied to ex-post and ex-ante analysis of initiatives) and a related set of data to be collected across OECD countries, the application enables to map initiatives and develop a common set of metrics to consistently assess impact and value creation within and across countries.

The OECD analysis addresses some interesting needs for governments and for public at large with respect to open data; among these needs, it is worth mentioning:

- Enhancing ability to combine different datasets also for their re-use, such as mixing public data with commercial, civil society and citizen input data, can help develop additional, more innovative

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[29] (http://data.gov.uk)
[30] https://www.whitehouse.gov/open
[31] http://ec.europa.eu/digital-agenda/en/open-data-0

and better products and services. Indeed the availability of the information in a machine-readable format as well as data cataloguing and metadata can facilitate data cross-reference and interoperability.

- Understanding the context of data demand. Users can play a key role in helping governments create value out of OGD. The involvement of different stakeholders in the various steps of the value chain, and particularly in identifying relevant data and the most adequate format, given the use they intend to make of the data, can significantly increase the value of data. This can ensure that data supply meets the demand, generating the needed level of uptake to create value.

- Grasping the value of open government data for the public sector. Analysis shows that there is a growing sense of awareness of the potential value for the citizens and for the wider economy which may be derived from opening up government data and enabling wide re-use. However, there does not seem to be strong focus yet on understanding the value for the public sector emerging from OGD.

Open governmental data holds a great potential for economic growth and societal progress but, to exploit this potential, open data need to be provided in a format which allows to be accessed and re-used by engaged citizens. To this effect, on one hand, civil society, academia and the research world are working to provide concrete solutions[32] and to develop appropriate methodological tools (see next sub-section). On the other hand, at a European level is very active the role of the European Commission to revise and strengthen its public data strategy by targeting the legal framework for re-use and available support tools [2].

### 4.6. Academia and research world

As previously mentioned, innovations in technology and developments in digital devices have caused an explosion in the quantity and diversity of available digital data that may reveal remarkable insights into the collective behaviour of communities and hold the potential to support knowledge and drive social innovation. Today it is possible to collect, store, transfer, and combine huge amounts of data and to build up large archives. However, exploiting the information contained in these archives in an intelligent way turns out to be fairly difficult. In contrast to the abundance of data there is a growing need for tools that can transform these data into useful information and knowledge.

To this effect the research word jointly with the NSIs, whose efforts have been analysed previously, and under the aegis of international organisations, is developing methods for extracting information from this new wealth of digital data. Recent studies focus on fuzzy technique[33] and text mining techniques[34] that try to find interesting patterns from large databases. Text mining, also known as

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[32] Peterborough DNA programme presented by Trevor Gibson at Web-COSI *Workshop on Using Technology to Engage Citizens with Well-being Statistics – Perspectives from Official Statistics and Government* (Involvement of the Communities for Statistics) – 27 October 2014 OECD, Paris,
http://www.wikiprogress.org/images//Gibson_Peterborough_DNA_minus_video.pdf

[33] M. Hudec and D. Praženka (2015), "Collecting, storing and managing fuzzy data in statistical relational databases", NTTS2015 Conference, Brussels.

[34] Text mining techniques have been investigated among the activities of the FP7 project BLUE-ETS (http://www.blue-ets.istat.it/) Main results are reported in the article by Simona Balbi, Agnieszka Stawinoga, Nicole Triunfo (2012), "Text Mining tools for extracting knowledge from Firms Annual Reports" http://lexicometrica.univ-paris3.fr/jadt/jadt2012/Communications/Balbi,%20Simona%20et%20al.%20-%20Text%20Mining%20tools.pdf

Intelligent Text Analysis, Text Data Mining or Knowledge-Discovery in Text (KDT), refers generally to the process of extracting interesting and non-trivial information and knowledge from unstructured or semi-structured data sets such as emails, full-text documents and HTML files.

Moreover, the internet has grown to be a major source of information not only because of all the content that is online, but also because the activities that take place online can be tracked. Hence, as witnessed by recent studies presented at the last NTTS Conference[35,36], a new stream of research has emerged with its focus on the use of internet-based data to forecast economic variables. Economists have started to explore the potential of the big data coming from on-line search behaviour. Several papers have investigated the usefulness of internet search data in order to improve the now casting and forecasting of economic indicators, with special attention to unemployment.

Another important stream of research[37] deals with open data that Governments, organisations and companies are increasingly launching on data portals. The ability to manage statistical data at a web scale provides unprecedented analysis opportunities but requires methodologies that allow to find data from different sources, integrate, analyse and visualise them in different ways. Most of these studies concerns open data which are of statistical nature that can be structured as multi-dimensional data cubes, where each cell contains a measure or a set of measures. To this end, research is developing linked data technologies that have the potential to realise the vision of finding, combining, analysing and visualising previously isolated cubes at a web scale with the final aim of enabling people to reap all the benefits of open statistical data.

### 4.7. The Business world

The business world plays a key role within the above depicted conceptual framework, as it deals with the new way of making and using data resulting from the digital revolution. Private companies can be both data users and producers: data are used in starting up business, in making market analysis or with the aim of widening business. At the same time, private companies can be data provider not only as producer of data as the core business of their activity (e.g., private companies that gather data on behalf of NSIs or Government) but also as owner of huge amounts of data, collected during their peculiar activity (e.g., mobile companies, search engine companies, energy providers companies,…).

On a side companies are using data/big data to understand their business better, such as to develop key performance indicators, to understand clients' behaviour, and interactions client/company. Big data allows a narrow segmentation of customers and therefore much more precisely tailored products or services. Sophisticated analysis can be used to improve the development of the next generation of products and services and to support decision-making. Undoubtedly, companies will have to address several issues to capture the full potential of big data. Organisations need not only to put the right talent and technology in place but also structure workflows and incentives to

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[35] J. Tuhkuri (2015), "Big Data: Google Searches Predict Unemployment in Finland", NTTS2015 Conference, Brussels.
[36] M. R. Vicente, A. Jesús López and R. Pérez (2015), "Forecasting skyrocketing unemployment with big data, NTTS2015 Conference, Brussels.
[37] E. Tambouris, E. Kalampokis and K. Tarabanis (2015), "ICT Tools for statistical linked open data: The OpenCube toolkit", NTTS2015 Conference, Brussels.

optimise the use of big data. Access to data is critical, companies will increasingly need to integrate information from multiple data sources, often from third parties, and the incentives have to be in place to enable this.

On the other side, there are many companies which own a huge amount of data collected due to their specific activity, representing in this sense a multiplicity of sources. This is the case, for example, of mobile phone companies, energy providers (e.g. smart metres), social media and aggregator companies (Google, Facebook, etc.), e-commerce and the use of credit cards for commercial transactions, data from sensors (e.g., traffic sensors). This kind of companies have a twofold role: they can use their own data for their commercial purposes or else they can put at disposal their data for other users. This last aspect implies a crucial debate on the collection and re-use of data and the need to establish public-private partnerships among NSIs, governmental agencies and these providers. The ensuing issues stemming from this new phenomenon are related to privacy, security, intellectual property, and even liability as well as legal aspects in terms of granting true open access to data and defining a general legal framework.

Last but not least, with regard to the financial aspect, the question of accessing big data owned by private companies by NSIs and government agencies whether for free or through fiscal incentives to the providers or simply buying data, is still under debate.

Another data source that deserves attention is the data on sustainability publicly reported by companies and organisations, in the framework of Corporate Social Responsibility[38], to inform communities and driving societal change. Sustainability data shows how seriously companies take their role in the transition to a sustainable economy. Every day people make countless choices about companies, and this has direct and indirect impacts on the economy, the environment and society. Knowing how much energy a company uses compared to its competitors, or how it addresses the issue of child labour in the supply chain, can inform those decisions, helping people to make a positive impact with their choices. To this effect an important initiative is GRI (Global Reporting Initiative[39]) that provides Sustainability Reporting Guidelines for companies of all sizes, in all sectors, to help them collect, analyse and publish their sustainability data. As well, within CAPS (Collective Awareness Platforms for Sustainability and Social Innovation) projects, it is important to mention Wikirate project[40] aimed at developing an open social networking system that allows Internet users to cooperatively create and share knowledge on company behaviour, allowing consumers and stakeholders, such as policymakers or the media, to be better informed.

## 5. The Young people involvement

For the definition of better statistics, for the enforcement of their access, understanding, and use it is crucial the involvement of young people. Young people's voices are not always heard in measurement and policy debates, where the concerns of older adults often predominate. It is urgent to find ways to better integrate young people's concerns into policy, and ensure their well-being

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[38] Corporate social responsibility (CSR) refers to companies taking responsibility for their impact on society. The European Commission believes that CSR is important for the sustainability, competitiveness, and innovation of EU enterprises and the EU economy. It brings benefits for risk management, cost savings, access to capital, customer relationships, and human resource management. http://ec.europa.eu/growth/industry/corporate-social-responsibility/

[39] https://www.globalreporting.org

[40] http://wikirate.org/

needs are being met therefore pressing goals for society. A recent survey, supported by EC, has demonstrated that EU young people are really interested in politics and that *"despite the cynicism, young people continue to dream of a better collective future. They would like to see more direct forms of democracy, a better economy so people can earn a living, and improved and more honest communication between politicians and people"* [41]. Therefore, on a side the new generations are particularly sensitive to be involved in what data and information say to push economic growth in terms of well-being for a sustainable societal progress close to their expectations of the future. Moreover, on the other side young people are the ones who will contribute to construct new and better statistics thanks to their effort to be proactive using new skills and technologies.

Web-COSI project is contributing on both sides with the set-up of a *Youth Portal* and the set-up of the *Wikiprogress University Programme.*

### 5.1. The Youth Portal

The *Youth Portal*[42] is conceived to foster the engagement of young people with statistics and information beyond GDP. The portal was designed by Wikiprogress team (OECD) consulting with a number of young people including volunteers, as well as using social media to crowd source advice and suggestions. The consultation suggested the need for: i) more visual content; ii) information to help young people get more involved in promoting 'beyond GDP' actions and policies such as studying, interning and volunteering opportunities; iii) accessible educational resources for students; iv) more content reflecting topics of particular interest to young people, such as education and employment; v) opportunities for young people to get more directly involved in discussions on the measurement of well-being and progress.

Against these suggestions, the Youth Portal, launched the 1st December 2014, was structured with a number of sections:

- A Videos section, bringing together interesting video content relevant to young people;
- A 'Have Your Say' section, which links to the most recent online discussion on Youth Well-being to which young people can contribute;
- An 'Initiatives' section which brings together information on initiatives related to youth well-being in one place;
- A 'Spotlight' section which highlights recent reports and other content of particular significance to young people;
- An 'Opportunities and Events' section which collates information about conferences, internships and volunteering opportunities for young people to get more involved.

***On line discussion on Youth well-being: measuring what matters***

In December 2014, on the new born Youth Portal, it was carried out the on line discussion on *Youth well-being: measuring what matters* which deserves a particular attention as it represents a crucial moment for Web-COSI to deepen the dialogue on new statistics in the perspective from the young generation. The discussion was launched to engage young people on the issues of particular relevance to youth well-being policy and measurement. In all these respects, the online discussion

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[41] See the article "Think young people aren't interested in politics? You'll be surprised " at http://horizon-magazine.eu/article/think-young-people-aren-t-interested-politics-you-ll-be-surprised_en.html.
[42] http://www.wikiprogress.org/index.php/Youth_Portal

was a great success. The discussion generated a great deal of activity, indeed, this was the most successful online discussion held on Wikiprogress platform with respect to the activity it generated on social media. In total, the discussion received: i) a total of 2,470 page views and 1,852 unique visitors; ii) according to the Tweet Reach report the two hashtags #youth and #wellbeing used, reached over 385,232 twitter accounts; iii) 62 comments were left on the discussion thread by 38 different people, of whom many were young people unaffiliated with any organization.

It demonstrates how the new generations want to be actors (affiliated and individuals) willing to give their constructive contribution on what it is the meaning of societal progress.

Moreover, the Youth Portal represents also the entry point into the Wikiprogress University Programme platform.

5.2. The Wikiprogress University Programme

The *Wikiprogress University Programme* [43] was setup with the awareness that the students of today are the decision makers of tomorrow who have to be involved now in the discussion about the meaning and measurement of well-being to make grow the necessary skills to treat the issues generated by beyond GDP movement. The University Programme wants to contribute to the many initiatives carried out during the last years to foster the education on new statistics and information, involving a wide range of different conceptual, methodological and professional approaches to the issues of well-being and progress measures and their use: statistics, economics, policy analysis, psychology, sociology, urban planning, environmental science, IT, communications, journalism, and philosophy.

In this direction, it is important to point out the EMOS initiative (European Master on Official Statistics) carried out by EUROSTAT with the aim to develop training and education in Official Statistics within existing Master programmes at European universities. EMOS represents a European network of universities and national statistical authorities working together to share and further develop the area of Official Statistics[44].

Against this background, the primary purpose of the Wikiprogress University Programme is to provide the means of establishing a network - of both interested educational institutions, and of then students themselves - around these issues. The Programme functions as a platform around which people from very diverse backgrounds and disciplines can come together to find common ground in the pursuit of better measures and policies for people's lives.

The platform, setup by Wikiprogress team (OECD), consists in three sections to bring together information and resources for students:

1) opportunities to collaborate with Wikiprogress by participating in discussions, volunteering, interning, or establishing a partnership between the student's university and Wikiprogress;

2) educational resources, including accessible reports and other information to educate students on the role and importance of 'beyond GDP' statistics;

3) courses and training opportunities, for those who would like to acquire the necessary skills and knowledge to get more involved in the 'beyond GDP' movement.

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[43] http://www.wikiprogress.org/index.php/Wikiprogress_University
[44] http://ec.europa.eu/eurostat/web/european-statistical-system/emos

*Opportunities*

The opportunities section groups the different ways for students and educational institutions to get involved under four headings:

- *University partnerships*, such as the type established with the Universitá degli Studi of Florence/Istat and the Gran Sasso Science Institute.
- Different ways of *contributing to the Wikiprogress platform*, including:
    - Joining the **Youth Advisory Board**, to provide feedback on how to improve the site and to test new developments and tools on the Wikiprogress site and associated platforms (blog, Facebook, Twitter).
    - Suggesting content for **social media networks**, letting know about interesting projects and news that could be shared with the Wikiprogress community.
    - **Volunteering** with the Wikiprogress team on a regular basis.
- Joining online discussions and debates on youth well-being
- Applying for an internship with the OECD Wikiprogress team

*Educational resources*

The educational resources section brings together accessible content to teach students and other interested people (especially young people) about well-being and progress. This section includes:

- Videos
- Presentations that have been given as part of the Wikiprogress University Programme seminars
- Reports and papers
- Websites

*Courses and Training*

This section brings together information about courses and training courses related to well-being and quality of life measurement, and the use of statistics to impact policy and societal outcomes. Currently, courses are listed under two headings:

- Well-being and quality of life measurement
- Data analysis, data visualisation and data journalism

The Wikiprogress University Programme has a lot of potential to grow, and to foster a network of engaged young people and relevant academic institutions across Europe. The activities organised so far are remarkable. It has been established relationship with Academia and selected Institutions. Several seminars promoted by Wikiprogrees University Programme were held at the University of Bologna[45] and at the Gran Sasso Science Institute[46]. Lectures were held for the 1st QoLexity II Level Masters Course organised by the University of Florence jointly with Istat[47].

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[45] See "The R&D projects funded by the European Union: The recent experience of the Web-COSI project at the statistical and economic research frontier", Donatella Fazio, Istat. Seminar given by Donatella Fazio, Istat at the University of Bologna on 27 November 2014 (http://www.webcosi.eu/images/2014/12/Bologna-Seminar-Web-COSI.pdf )

## 6. From the construction to the usage of beyond GDP statistics: policy use

From the construction to the policy use of beyond GDP statistics is a great matter representing a fundamental challenge to face in this moment of economic (and political) crisis which is altercating the *old* capitalistic approach. Policy makers and opinion leaders have been used to measuring the progress dealing mainly with a unique data – the Gross Domestic Product. The beyond GDP vision implies to widen the view and to deal with a set of data and indicators that makes more *"difficult"* and *"different"* to take decisions.

Now Governments are embedding the concept that the measurement of the progress is complex and that policy makers have to think in an integrated way abandoning the stove pipe approach. To look at the societal progress in terms of well-being and sustainability politicians have to think in order to optimize the results *for all* overpassing the vision of maximizing the results *for a part.*

Some good practices of policy frameworks, that put the notion of well-being (or an expanded notion of living standards) at the centre of the process are well known. Bhutan- with its Gross National Happiness[48] (GNH) synthetic index, New Zeeland - with the Treasury's Living Standards Framework[49], and Scotland - with its Performs Strategic Goals[50], have consolidated the setup and usage of integrated systems of data and information beyond GDP in order to define the societal objectives, to steer the choices of the policy actions and monitor the results reached. While the most of the EU Governments are trying to find a way to move towards a beyond GDP strategy to make policy.

A good example of beginning effort towards this strategy is Italy. The BES integrated framework setup by Istat-CNEL (see section 1) has been "cited" in the last two years annual DEF (Documento di Economia e Finanza) – document which defines each year the economic and financial pillars to drive the policy actions- as a system *to take into consideration*[51]. This is a good pace but very far from the new political strategy requested by the beyond GDP vision.

Given the multidimensional nature of well-being, the "real" challenge is to adopt an integrated multi-dimensional approach in political decision process in terms of well-being by providing a common set of criteria useful for priority setting across the whole of Government.

From the review of the studies and the analysis of National experiences [16], it is possible to remark the main challenges for a policy making that uses well-being as a core element of its strategy. They

[46] See "Citizenship to monitor quality of life and evaluate progress in cities", Seminar given by Kate Scrivens, OECD for the Doctoral Programme of the Gran Sasso Science Institute, 12 December 2014 (http://www.wikiprogress.org/index.php/Wikiprogress_University )
[47] The lectures given for the QoLexity Masters Course at the University of Florence are: "Communication and the policy use of indicators", by Donatella Fazio, Istat, on 26 September 2014 (see http://www.webcosi.eu/images/2014/12/Slides-3-Qolexity-FazioD.pdf) and "Transferring Knowledge into Policy and the role of Wikiprogress", given by Kate Scrivens, OECD , on 6 November 2014 (see http://www.wikiprogress.org/index.php/Wikiprogress_University )
[48] http://www.grossnationalhappiness.com/
[49] http://www.treasury.govt.nz/abouttreasury/higherlivingstandards
[50] http://www.gov.scot/About/Performance/scotPerforms
[51] For year 2015 see pages 99-100 at:
http://www.dt.tesoro.it/modules/documenti_it/analisi_progammazione/documenti_programmatici/SEZIONE_III_-_PNR_10_Aprile_xdeliberatox_on-line.pdf

range from the difficulty to treat large number of dimensions that these frameworks potentially cover to the limited availability of analytical models or empirical analysis dealing with the joint production function of various well-being dimensions, and to the difficulty of articulating a centralized framework with agency's specific goals, thus combining high-level objectives and instruments with sectorial objectives and policy tools.

The issues about the usage of new measurement beyond GDP by policy makers are challenges to face in further research and analysis, pushed by the awareness that policy-integrated frameworks have the potential to increase the consistency of policy decisions across the board by improving accountability, analysis and alignment of objectives with the final aim of better policies for a better quality of file. The next 5th OCED World Forum[52] on "Statistics, Knowledge and Policy: Transforming Policy, Changing Lives" will discuss on these open issues in a worldwide dimension, with the consciousness that the new approaches should grow up considering the global diversity as a chance to find a common way to advance and overpass the actual economic crisis putting Man at the center of the changes to adopt.

## 7. Conclusions. Next steps

*Summarizing*

From the review given above, some key elements on the involvement of Web Communities for Statistics (focusing on beyond GDP) and on the exploitation of new technologies to construct "better" statistics, can be underlined. Some observations and insights are points of strength while some others are open issues which lead to further implications.

> *The relationship among producers of data, citizens and stakeholders has deeply evolved moving from a pure top-down approach to a new one that combines top-down/ bottom-up approaches. To this effect new technology has played a key role in the engagement of citizens and stakeholders belonging to different sector of society.*

> *The interaction among users and producers of data has a different weight at local, national and supra national level.*

*NSIs* are setting up Web 2.0 initiatives to foster the interaction with citizens and to empower statistics via the usage of Internet as new source of data. NSIs are moving from fostering communication and dissemination of statistical information to the exploitation of new ways of collecting data from Internet evaluating the potential of crowd sourced platforms for a knowledge closer to citizens' needs. On this side the trade-off between having more and real-time information and the quality of the statistical information produced is an open issue.

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[52] http://www.oecd.org/statistics/5th-oecd-world-forum-guadalajara.htm

*Civil society* plays a major role in providing data and statistics on well-being: they integrate official statistics while covering with adequate, updated and fit-for-purpose statistical information relevant dimensions and aspects which determine or have a direct impact on the quality of life of citizens. The role played by civil society actors is a valuable lever for integration of official statistical information on well-being produced by public institutions at the local, national or supranational level. Civil society actors involved in the production of statistical information on well-being show a broad number of objectives: increasing and "democratizing" scientific knowledge; stimulating advocacy for better public policies; pressuring public institutions; engaging citizens; disseminating to the large public the "fundamentals" (e.g. statistical data, indicators, indexes...) to read and understand changes and challenges occurring in our complex societies. The role of CS is crucial at local level. In this direction the development of local portals, conceived as data warehouses and tools to dialogue among all the sectors of the locality have to be implemented.

*Social entrepreneurship* is an emerging and important force for a new economy based on a well-being societal progress. Social entrepreneurs are *young* users of data and often lack resources to analyze them at a consistent high level. Greater emphasis should be applied to enabling social entrepreneurs to partner with analysts and more awareness on how to access existing sources of data facilitated by Web2.0 technologies. In this direction it is important to build up a common language to deal with data and information close to SE needs.

*International Organizations*, such as OECD and UNECE, etc.., push for the usage of integrated (official and non-official) datasets in a wide perspective. The main effort is to harmonize the processes and the data in order to permit the comparison among the National realities and a ranking in terms of societal progress. The indicators so constructed put in evidence the matter of inequality among the different areas of the World.

*Academia and research world* are implied in the exploitation of new technologies, in partnership mainly with NSIs, to study how to use the *liquid data* available in the Net testing new techniques (text mining, text grasping, open data linkage, geo-referenced data) alongside the usage of crowd sourced data (locally generated data).

*Governments* are working to open data referred to their actions and results towards a public transparency and participation. The availability of free, accessible, comprehensible and updated data and information allow citizens to consciously and wittingly participate to democratic life. Opening up data by Governments means more than putting it on a website. For data to be truly open, not only must it be freely available online, but it should also be presented in a format that maximizes its potential for re-use. Methodology to re-use data as well as the linkage of Open Data from different sources are open issues which need further effort.

*Business world* is an actor that deals with new sources of data in different perspectives. On a side private ICT companies (Google, Facebook, etc…) can be data providers. On the other side the business need to know the consumers and their need to understand what and how to produce. In the first perspective the set-up of Private and Public Partnerships (PPP) is a matter to face. In the second perspective a close interaction with communities and a careful reading of new measurement of societal progress is an opportunity to catch.

***Young people*** are called to play a fundamental role.  New generations are particularly sensitive to be involved in what data and information say willing to give voices to push societal progress close to their expectations on the future. Young people are the ones who will contribute to construct new and better statistics thanks to their effort to be proactive using new skills and technologies. On this side the set-up of new curricula and training courses to educate new skills is an increasing  matter to deal with in the close future.

> ➢ *Web 2.0 technology has a particularly powerful role to play in the communication of data. Web 2.0 technology such as mobile and interactive web platforms allow statistical information to be packaged and presented in a way that is much more meaningful for a wider public.*

***Data visualizations*** can be very appealing, but their importance goes beyond aesthetics: they provide a unique means of highlighting new patterns in statistics and looking at the world in a different way. The visualization of data usage is vitally important in enhancing its understanding and engagement. On this side Web-COSI has contributed launching a data visualization competition for well-being data[53] (see below at *Web-COSI next steps*).

***Storytelling and narrative*** is needed to foster the understanding and usage of data. It is a way to help people to understand data and to feel that data can give a picture of the reality close to their individual status and that data can contribute to change behaviors and actions for individual and collective growth. In this direction there is also the necessity to combine quantitative indicators with qualitative ones and use *comparable data* (for instance: this phenomenon is equal *to four tennis courts).*

***Social inclusion*** through a common knowledge is facilitated by digital technology.  On this side more effort needs to be made to combat digital exclusion and to build up capacity in marginalized groups (e.g. developing countries, the elderly, the poor, and low-skilled).

> ➢ *The policy use of Beyond GDP statistics is a hard way to go ahead. On this side citizen engagement empowered  by Web2.0 is essential. If citizens are educated about the role of statistics in society and policy making, and of the need to put issues of well-being, sustainability, and inequality front and center, then there will be much greater political incentive for decision makers to enact reform, and to override entrenched interests opposing those reforms.*

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[53] http://wikiprogress.org/index.php/Visualizing_Well-being:_Wikiprogress_Data_Visualization_Contest_2015_-_The_Challenge

### Web-COSI next steps

The next 14th of October, Web-COSI will be at the 5th OECD World Forum on "Statistics, Knowledge and Policy: Transforming Policy, Changing Lives" at Guadalajara, Mexico. The Forum Talk on *"Opening up well-being statistics to new audiences: opportunities and challenges"* has been organized to present the Web-COSI experience[54] as an outstanding exercise, supported by the European Commission, of opening-up statistics to new audiences[55].

The Forum Talk sees the participation of a great expert in this field, Mr. Enrico Giovannini, former Minister of Labor and Social Policies in the Italian Government and chair of Web-COSI Advisory Board.

During the Forum Talk the three winners of *the data visualization competition* launched by Web-COSI / Wikiprogress will be awarded. The entries were judged with respect to clarity, concept and originality by an expert jury[56]. The three winning works are notable for their diversity and inventiveness of the applications.

- Scattered Well-Being by Andrew Mollica

The "visualization shows how varied well-being measures can be within a country and consequently how country-wide statistics can over-simplify. While it's convenient to characterize whole populations by talking about national averages, we are often masking a lot of important complexity. This visualization attempts to make understanding this complexity approachable by allowing users to view the overall distribution of different well-being indexes as well as let them focus on a particular area.

- Seeking a Better Life by Fidel Tomet

The visualization "takes a look at what people say is most important to them in life and how this reflects in their choice for a new home. It thereby also raises the question how other aspects, like distance, language and immigration laws, affect the decision."

- Access to Higher Education is Not Equal by Alice Feng

The concept behind this work is, "that although young adults in developed countries have generally become increasingly well-educated over time, when we take a closer look at the family backgrounds of those young adults, we see that children of less educated parents are under-represented relative to children of highly educated parents. Indeed, most college students come from already privileged backgrounds; children of parents with at most a secondary education are much less likely to enroll in higher education. Since higher levels of education are linked with greater earnings and better economic outcomes, this situation perpetuates inequality."

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[54] The Forum Talk is chaired by Kate Scrivens from OECD. The presentation on Web-COSI will be given by Donatella Fazio(Istat), the scientific coordinator of the project.

[55] Alongside the Forum Talk Web-COSI will be at the Exhibition Area of the Forum with a stand, managed by i-genious, where showcase the experience, distribute material and give demos on the portals developed by the project.

[56] The jury consisted of Kim Rees, Stefanie Posavec and Moritz Stefaner.

Back from Mexico, Web-COSI will keep on working to deliver the last outputs[57] and conclude its life cycle at the end of 2015 - formally the 3dt of December with its Final Conference (OECD premises, Paris). But the work is not ending in 2015.

Web-COSI for its nature is a starting point and its main outputs (represented by the following figure) will be implemented in the future.
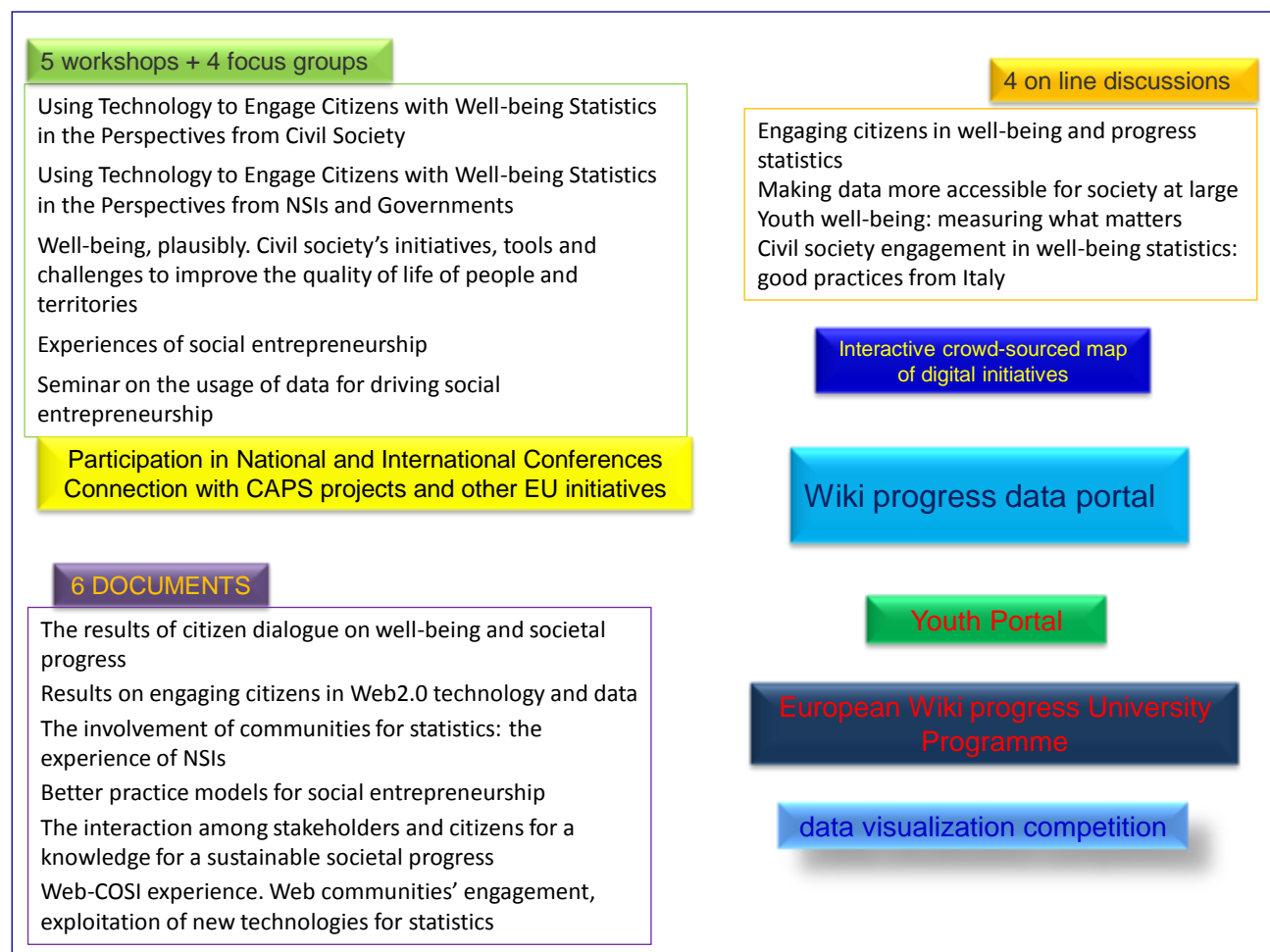


The debate generated among citizens and stakeholders will be kept alive through www.webcosi.eu and the Social Media connected to it.

New initiatives will be born through the portals released by the project:

- The *interactive crowd-sourced map of digital initiatives* will increase its figures.

- The *Youth Portal* and the *European Wiki progress University Programme* will growth engaging the new generations for an increasing understanding and usage of the new measurement of well-being and sustainable societal progress.

- The *Wiki progress data portal* is established and will contribute to foster the integration and complementarity of official statistics with non-official crowd sourced data.

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[57] A short film for social media distribution to showcase Web-COSI experience and a Policy Brief

*Concluding*

Web-COSI experience has demonstrated that the involvement of Web communities for statistics and the exploitation of new technologies to empower the construction, the understanding and the usage of new statistics (towards an integration of official statistics with non-official statistics) is a great challenge but is an inexorable process which requires new skills, culture and a radical change of mind set.

Web-COSI believes that encouraging communities to share, collaborate and make use of data and information at local and global level is a winning exercise. Create a critical mass on the importance of the usage of knowledge (data and information) is the way to build up a society "aware and conscious" of its possibilities (and limits) able to drive individual and collective behavior alongside policy actions for a sustainable societal growth.

Web-COSI has experimented the crucial importance of the partnerships among different sectors of society. Only joint efforts of traditional stakeholders and new ones – putting together *expert* and *non-expert* forces – can *steer* the exploitation of *all* the sources of data and information to create a shared awareness towards Social Innovation.

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