How data revolution and new policy demands create new requirements for capacity building and training official statisticians?

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Introduction

In the Report *A World that counts: mobilizing the data revolution for sustainable development* prepared by the Independent Advisory Expert Group (IAEG) established by the UN Secretary General on the data revolution, several proposals were presented on how to manage and steer the ongoing processes that are now called "data revolution". The Synthesis Report *The Road to Dignity by 2030: Ending Poverty, Transforming all Lives and Protecting the Planet* picked up most of the proposals made by the IEAG, presenting them in the more comprehensive framework of the Post-2015 Development Agenda that is being negotiated by UN countries.

In this context, the UN Statistical Commission is asked to discuss how to contribute to this process and take important decisions. The papers prepared by the Secretariat and by the Friends of the Chair (FOC) on "Broader measures of progress", as well as the conclusions of the January 2015 global Conference organised by UNSD and Eurostat on *"A Transformative agenda for official statistics"* supported several proposals made by the IAEG and provided additional suggestions. I personally hope that the UNSC will take important, courageous and forward-looking decisions in the next few days: in fact, the international statistical system needs to speed up its work, improve its governance and coordination, fully behave as a "system" reducing the existing duplications of effort, invest in common infrastructures overcoming the current fragmentation, and the "data revolution" could be a great booster in this respect.

One of the strong calls made by the IEAG Report concerns the need to build capacity to develop and benefit from the data revolution worldwide, but especially in less developed countries. In particular, in the Executive Summary the Report states that:

> *Improving data is a development agenda in its own right, and can improve the targeting of existing resources and spur new economic opportunities. Existing gaps can only be overcome through new investments and the strengthening of capacities. A new funding stream to support the data revolution for sustainable development should be endorsed at the "Third International Conference on Financing for Development", in Addis Ababa in July 2015. An assessment will be needed of the scale of investments, capacity development and technology transfer that is required, especially for low income countries; and proposals developed for mechanisms to leverage the creativity and resources of the private sector. Funding will also be needed to implement an education program aimed at improving people's, infomediaries' and public servants' capacity and data literacy to break down barriers between people and data.*

Moreover, the Report underlines that:

> *There is also a risk of growing inequality. Major gaps are already opening up between the data haves and have-nots. Without action, a whole new inequality frontier will open up, splitting the world between those who know, and those who do not.*

How to build appropriate capacity in less developed countries is a very big issue, currently under discussion in several fora. An important contribution will come from the PARIS21 project *Informing a Data Revolution*[1], as well from the work carried out by the World Bank, the Sustainable Development Network Solutions and other institutions.

Given the topic of this High Level Forum on Official Statistics *"Partnership for capacity in the context of the data revolution"*, it is useful to underline that, for the development of a comprehensive strategy to build capacity in less developed countries, there are three key aspects to consider:

- the availability of appropriate human capital in national statistical offices (NSOs) and systems (NSSs) is vital to fully benefit from the data revolution;
- the availability of appropriate technical infrastructures is a necessary, although not sufficient, to carry out data revolution-related activities;
- the availability of appropriate governance structures to make NSOs and NSSs efficient and effective in the context of the data revolution is vital to manage the transition to the "new normal".

Of course, most of the actions needed to develop appropriate capacities require financial support and a strong coordination among donors and agencies that provide technical assistance, but this issue will not be covered in this paper, which, also building on proposals made during recent events and in the IEAG report, will focus on some possible actions concerning the first point.

How to build a generation of "data revolutionaries" for fostering and monitoring sustainable development?

In most debates about statistical capacity building the focus is, correctly, on less developed countries. As highlighted by the IEAG Report, in the case of the "data revolution" all national statistical offices and systems, including the most developed ones, as well as international organisations, face big challenges and opportunities: therefore, a strong leadership is needed in all countries and in international organisations.

Moreover, the recent UNSD-Eurostat Conference made clear that organisational, technical and governance issues due to the "data revolution" are closely linked to each other: therefore, without appropriate and qualified human capital is very unlikely that NSOs and NSSs will be able to make the necessary transition to the new environment. This requirement also concerns data users, not only producers: as a lot of existing data could be already used to improve decision making at all levels, and to foster sustainable development, the IEAG Report recommends that:

> *To close the gap between people able to benefit from data and those who cannot, in 2015 the UN should work with other organisations to develop an education program and promote new learning approaches to improve people's, infomediaries' and public servants' data literacy.*

Of course, the discussion on how to build human capital in NSOs, NSSs and other parts of modern societies is not new, but it is clear that the Post-2015 Development Agenda is a great opportunity to

[1] See www.datarevolution.paris21.org.

take this topic at the next level. For example, one of the key proposals made during the UNSD-Eurostat Conference, and endorsed by the participants, is to formulate a truly coordinated Global Statistical Programme around the overall objective of modernizing statistics and strengthening the global, regional and national statistical systems in order to respond more effectively and efficiently to the new policy requirements, such as the Post-2015 Development Agenda. The broad programmatic areas of such Global Statistical Programme should include:

- statistical standards and methods;
- data collection, production and dissemination;
- innovative methods, techniques and IT infrastructure, including standards-based business architecture;
- communication/advocacy including resource mobilization;
- technical cooperation assistance and training.

If the proposal is endorsed by the UNSC, the international statistical system will be asked to develop a more advanced and more integrated approach to capacity building: this would be very welcomed by both recipient countries and donors, given the criticisms made to the current state of play.

As far as the modernization of statistical systems, four areas require the development of stronger skills in NSOs, NSSs and international organisations:

> *"One is the cultural change related to finding new ways of managing resources and modernizing the production of statistics. This is linked with transforming the 'mind set' of official statisticians. A second area is acquiring new skills including project management (skills) needed to set up a service-oriented business model aiming at providing information. A third area is adopting new technologies and innovations to improve the data production business processes. A fourth area is improving the quality and methodology of official statistics by aligning with international standards and best practices".*

One of working groups also noted that the lack of staff and the high turnover of staff represent a challenge in a number of NSOs, particularly in developing countries, and that the salaries and work conditions may not be attractive in NSOs as compared to the private/public sector and this can be a deterrent to attract new skilled workforce. Of course, these issues, although present in all countries, need to be urgently addressed in developing countries.

Assuming that UNSC will soon decide to take actions as suggested by IEAG, FOC and the UNSD-Eurostat Conference, the following ideas could be explored to improve the quality of human capital in NSOs and NSSs, as well in the international organisations, for three different target groups:

- chief statisticians and top managers;
- middle-managers;
- statisticians working in NSOs and in international organisations.

From "Chief statisticians" to "Chief data revolution officers"

As noted in the IEAG Report, the data revolution is already happening:

> *The volumes of both traditional sources of data and new sources have been rising, and openness is increasing. Thanks to new technologies, the volume, level of detail, and speed of data available on societies, the economy and the environment is without precedent. Governments, companies, researchers and citizens groups are in a ferment of experimentation, innovation and adaptation to the new world of data. People, economies and societies are adjusting to a world of faster, more networked and more comprehensive data – and all the fears and dangers, as well as opportunities, that brings.*

There are several keywords in this sentence, all relevant for this discussion: new, unprecedented, ferment, experimentation, innovation, adaptation, faster, networked, comprehensive, fears, dangers, opportunities. All of them communicate enthusiasm and/or worry, depending on how you look at it. If you think that you can be a "winner" in this revolution you should be very excited and anxious to contribute to these processes; on the contrary, if you feel unable to cope with the change, then you may either dismiss these ideas, or try to delay their impact on your organisation.

I still remember when, few years ago, during an ISI conference, I talked about the forthcoming challenges for official statistics coming from new technologies and mentioned the idea of a "paradigm shift" towards what I called "Statistics 2.0", suggesting that official statisticians had to evolve from being "local information providers" to "global knowledge builders". During the discussion, the head of the statistical division of an important international organisation said: "this is not a paradigm shift, it is just a hype that will soon disappear". Of course, he was wrong, but unfortunately his message was taken seriously by several people, who refused to anticipate the change and then were taken by surprise by the "data revolution".

Similarly, ten years ago, a proposal to launch an international task force to look at the measurement of sustainable development was dismissed by the Bureau of the Conference of European Statisticians (CES), where some chief statisticians said: "sustainable development is a political buzzword and it is not an official statistics' business". Fortunately, after a couple of years they changed their mind and very good work was subsequently done in this field under the auspices of the CES.

These two episodes show that chief statisticians must be very forward looking to face emerging statistical needs, benefit from opportunities and manage risks. In this respect, the IEAG Report underlines that, in a not distant future:

> *(Statistical systems) may be less about producing data and more about managing and curating data and information created outside of their organisations.*

and that:

> *National statistical offices, the traditional guardians of public data for the public good, will remain central to the whole of government efforts to harness the data revolution for sustainable development. To fill this role, however, they will need to change, and more quickly than in the past, and continue to adapt, abandoning expensive and cumbersome production processes, incorporating new data sources, including administrative data from other government departments, and focusing on providing data that is human and machine-readable, compatible with geospatial information systems and available quickly enough to ensure that the data cycle matches the decision cycle. In many cases, technical and financial investments will be needed to enable those changes to happen,*

and strong collaboration between public institutions and the private sector can help official agencies to jump straight to new technologies and ways of doing things.

What is at stake is the role of official statistics in the "data revolution age", characterised, among other things, by an imbalanced distribution of investments in data collection, treatment and dissemination between the public and the private sector. While the former is cutting the resources for official statistics, the latter is investing money on data collection, processing and use at an unprecedented scale.

It is quite clear that, given the pace of change, being a chief statistician today is harder than ever and will be even harder in future. Being a good manager or a good statistician is not enough. It is necessary to be "excellent" in all these things, but also be able to read the "weak signals" coming from non-statistical communities, such as those of ICT leaders, futurologists, scientists, political scientists, neuroscientists, etc.. It is necessary to engage the private sector in innovative collaborative projects, to establish a continuous dialogue with media and the civil society, to be a credible partner of research institutions at national and international levels, etc.

If we recognize that the world is accelerating and that statistical systems risk to be left behind, then we need to dramatically speed up the pace at which statistical systems have to move forward in order to catch up and, possibly, become frontrunners. This is why the international statistical system needs leaders at all levels, able to drive this change. But the question is: do we have a well-established system to build a generation of "chief data revolution officers"?

Unfortunately, the answer is negative. For example, we do not have MBA courses to train chief statisticians or top managers of NSOs and NSSs, and while the private sector is investing a lot of money to keep its managers up to date, the international statistical system has not even precisely defined the skills needed to perform this kind of role. The ISI has recently launched an initiative to develop better training courses for chief statisticians and top managers of NSOs: this a good sign, but still insufficient[2].

Proposal: Establish a high-quality international training programme for chief statisticians and top statistical managers**.** To this end, a working group should be established to:

- develop and continuously update a syllabus to organise advanced courses for chief statisticians and top statistical managers. The courses should especially cover topics related to managerial skills, especially needed in the context of the data revolution (change management, outsourcing management, etc.);
- explore the possibility of using MOOCs and other online resources to develop, in cooperation with academic institutions and other interested parties, a system of "continuous learning" for chief statisticians and top statistical managers;
- foster the interactions with experts who work in relevant fields (ICT, media, etc.), in order to identify future opportunities and challenges for statistical systems in the context of the "data revolution";
- explore the possibility of establishing a programme of "mentoring" for chief statisticians working in developing countries;

[2] The first ISI workshop, to be held in Dar Es Saalam (Tanzania) in April, has the objective "to build a strong community of innovative and visionary leaders in official statistics who will be able to respond to the demands of the Post-2015 Development Agenda and develop innovative strategies for structural improvements of statistical offices and systems". The sessions will be focused on: Regional needs for statistical capacity building; Ethics in the Statistical Practice; Data Revolution at country level and managing the change process; Cooperation with researchers and academia; How to organise the efficient process of statistical capacity building.

- develop further proposals to build a generation of future leaders for the international statistical system.

The UN University, the UN Foundation, the ISI, regional bodies active in statistical training, foundations and other research institutions, as well as a group of NSOs and international organisations, could be mobilised to perform these tasks and present concrete proposals at the 2016 UNSC.

Being a middle-manager in the age of the data revolution

The transformation required to NSOs and NSSs is quite remarkable and it should be carried out in an accelerated way. But without an accurate understanding of the characteristics of such a transformation, and therefore of the required skills, there is a high risk of wasting money for running unnecessary or inappropriate training courses. On the other hand, what is needed is not a one-off training effort, but the establishment of a "continuous" training process that will avoid, also in future, the obsolescence of existing human capital. Moreover, it is important, when recruiting new staff, to be able to identify and select people with the "right" skills and the appropriate mind set to make the transition happening. Finally, it is vital that middle-managers are able to fully exploit the capacity of old and new staff able to make the change happening, avoiding to block innovation and the adoption of new approaches.

With this in mind, it is quite clear that a first group of key people who need a special training on the opportunities and the features of the "data revolution" is represented by middle-managers of NSOs and other institutions who take care of:

- recruitment and training programmes;
- statistical processes;
- communication/dissemination activities;
- ICT tools and systems.

While the international statistical system already provides opportunities for exchanging best practices on statistical issues, as well as on dissemination/communication opportunities, so far there isn't any well structured network of experts in human resources. In Europe, Eurostat and UNECE have developed important initiatives in this area, but other regions are clearly lagging behind.

Proposal: Establish an international network of people in charge of human resources management in NSOs and in international organisations in all regions of the world. The network should:

- exchange information and best practices concerning recruitment, training and human resources development;
- elaborate proposals to exploit economies of scale, improve international coordination and underpin the training section of the forthcoming Global Statistical Programme;
- develop and continuously update job descriptions for key positions, to be used by interested institutions when publishing job vacancies.

Proposal: Establish master courses in official statistics in all regions of the world**.** In Europe, the EMOS (European Master in Official Statistics) has been established with the aim of strengthening human capital available in NSOs, as well as of preparing a new generation of official statisticians. EMOS is based on a network of academic institutions and NSOs, coordinated by Eurostat, and will start its activities in few months. Similar arrangements could be established in other regions, in the

context of the abovementioned network, learning from the European experience. They could be financed by both public and private institutions, based on a global "faculty" of first-class experts and provided with state-of-art teaching facilities. The network could also organise residential courses in the various regions of the world, to ensure a "lifelong learning" approach.

Being an official statistician in the age of the data revolution

According to a recent report by the American Statistical Association (ASA), statistics is the fastest-growing science, technology, engineering and math (STEM) undergraduate degree in the United States over the last four years[3]. On the other hand, a growing number of universities is organising courses in data science[4]. In this fast changing environment it may be not so easy, especially for NSOs in less developed countries, to identify the best training opportunities for their staff.

Proposal: Establish an international observatory aimed at identifying the best training courses on data revolution-related issues. Therefore, a useful activity could be represented by the development of an international observatory-network to assess existing training opportunities worldwide and provide guidance, especially to less developed NSOs, on how and where to invest the limited available resources. For example, "The World of Statistics" or a similar initiative could be strengthened to perform this task, in close connection with other interested parties.

Proposal: Build a unique catalogue of training programmes provided by international and regional organisations for NSOs staff, especially in developing countries. In the context of the Global Statistical Programme, all international and regional organisations who provide technical assistance and training courses should bring, in a single repository, relevant information about the forthcoming events and initiatives. Subsequently, this information could be used to improve the training and find synergies, also to save money and fill gaps concerning important new fields. PARIS21 could play an important role in this area, providing an overall knowledge base built reusing existing platforms and fostering a greater coordination of efforts.

As described in the IEAG Report, it is likely that international organisations active in statistics will change quite radically their role. The collection and standardisation of data produced by national and other international sources will be easier thanks to the development and the adoption of common standards for data and metadata exchange. On the contrary, there will be more opportunities to directly process Big Data and exploit non-statistical sources, and to provide value-added to data coming from statistical sources, but the type of skills requested to perform these activities will be different from those currently owned by existing staff. It is, then, likely that international organisations will express a strong demand for re-training their staff, that will become more similar to (and maybe more interchangeable with) the experts working in NSOs.

Proposal: Develop a programme for international mobility of statisticians. The program could try to overcome existing problems due to different contractual arrangements, wage differentials, etc. and promote mobility and exchanges between national and international organisations, as well as between NSOs.

Memory item: improving data literacy of journalists, infomediaries, civil servants and citizens

[3] http://www.worldofstatistics.org/files/2015/02/February-4-2015.pdf
[4] http://www.mastersindatascience.org/specialties/business-analytics/

Although this issue is not directly related to the training of official statisticians, building numeracy in modern societies is a way to maximise the valued added of statistics and improve the society's consideration of the importance of high-quality statistics. This is why the IEAG Report recommends to establish a global programme to improve people's numeracy, with a special attention to journalists, infomediaries and civil servants.

A lot of work is being already done by several NSOs, as well as by the International Association of Statistical Education (IASE), but, like in the previous cases, a stronger international coordination would be beneficial. Moreover, a specific programme for transferring best practices to NSOs and other relevant institutions working in developing countries should be launched in the context of the forthcoming capacity building initiatives.