

## **Visualizations – an integrated part of the digital communication strategy**

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### **Abstract**

The world of statistics is continually challenged by its remit to depict and explain complex social and economic phenomena and their relative importance in, and impact on, today's society. The future of statistical communication lies in the ability of statisticians to proactively extract relevant statistics and visualise these to explain and compare the structure and dynamics of our society in context and in a way that can be swiftly absorbed, easily understood and re-used by professionals or citizens in general. Visualisation and digital narratives allow economic agents, professional users, households and the media to understand and re-use statistics for their own assessments. Communicating statistics thereby amplifies the effects of using quality statistics by generating trust and knowledge to contribute to the public debate.

**Keywords: Statistics, digital visualisation, communication strategy**

### **1. Digital transformation – Time to embrace digital communication**

The ability to enhance the statistical communication strategy requires, among others, to identify and use trends and developments within society. There is a growing concern that traditional institutions are not keeping up with the generation(s) of citizens who are digital natives who share short-lived information quickly. Another concern is that traditional institutions are not disseminating statistics using digital tools and media, where the digital natives get and share their sources and knowledge. This is important in today's information age, as the sheer volume of digital data available is already tremendous and finding the relevant statistics is an increasingly complex task.

The Internet represents a form of decentralized network interaction that is markedly different from the traditional release method applied by statisticians such as releasing statistics in own external databases. The increased use of Internet services, knowledge sharing in blogs and online communications/- which combines news, text, graphics, video, interactivity, group sharing, the linking of knowledge and the transfer of information among different platforms and devices - is common practice for a growing number of digital natives and digital adapters. Furthermore, with the benefits of cloud computing and open source software, data are being shared and used everywhere. Not only do open-source, collaborative technologies allow information to be easily presented, shared and communicated within short time spans, they also allow for improving the way information is provided.

This is a continuous development, as wikis, blogs and other technologies are much more than simply tools to allow collective contribution. They have also become vertical integration platforms, by collecting, discussing and re-distributing statistics and derived information.

Information and statistics are now being created, updated, discussed and made public by an engaged interactive community and traditional broader lines between the roles of experts and journalists are diminishing, as engaged citizens are assembling information on a particular topic, using worldwide resources to develop and share expert knowledge about a given subject. The speed, scope and manner in which digital communication occurs has changed radically and provides low-cost and fast collaborative infrastructure in ways that only large corporations could have accomplished in the past. This means that data users are changing their patterns on how to look for, use and share information and statistics.

***There is a growing gap between how statistics are presented to society and the way the growing digital community behaves, collects and re-uses statistics.***

The derived effects are beyond the digital technology as data and statistics are now available everywhere. The result is an explosion of often irrelevant and inaccurate publicly available data. This makes it more challenging and time consuming for citizens to critically distinguish between good and less robust statistics and raises the possibility that users will select the data and statistics most readily available to them. The increasing volume of data poses a significant risk to finding reliable and relevant statistics, making it an even more complex and time consuming task. It is also getting increasingly difficult to correct private messages supported by low and even misleading data as news gets swiftly redistributed via multiple digital channels and spreads like wild fires.

National and international statistical agencies may need to ask whether the public and private sectors currently have the necessary quality statistics in a format that leads to good and sustainable decision making. Or are good quality official statistics being sufficiently and transparently used as part of supporting and documenting current policy decisions? The statistician needs, in any case, to understand the causes and effects of why approximately 40% of citizens say that statistics do not play a role in decision making<sup>1</sup>.

This paper argues that the statistical community needs to become proactive and use digital communication to reach frequent users and intermediaries of statistics. One contribution to this objective is the use of “visualisations” as a powerful digital tool. In addition to this, the paper argues that national and international statistical agencies share the common interest and objective of rendering statistics to users. Against this background, there is a common objective and incentive not only to share experiences and discuss communication efforts and their reception by external users, but also to support and share relevant statistics and visualisation tools and to benefit from the synergies of contributing to a common (digital) visualisation framework.

## **2. Visualisations: A powerful digital tool that expands the statistical narrative and crowds out low quality statistics**

Statistical agencies need to proactively provide statistics that are easily understandable, presentable and re-useable, in visual form and using digital communication channels to reach a wider professional and public audience. The modern world is a complicated place that faces increasingly complex financial and economic choices, requiring a higher level of sophistication in communicating statistics. The challenge for the statistician is to extract wisdom from the large pool of data/statistics and present descriptive statistics in an economic and social context. Herein lies the challenge; to develop new techniques to manage, organise and release descriptive statistics that add user value by presenting statistics in a structured and interactive way, whereby the user can easily understand, integrate, re-use and re-communicate the statistics to a wider or specialised audience.

Here again, statistical organisations have a competitive advantage based on the long-held reputation of providing independent, factual and credible explanatory statistics of high quality. Unless a policy and the statistics underpinning it can be explained, it will not be understood and the institution carrying it out will lose credibility and trust.

There are ample digital tools and free-ware available to help statisticians present a visual narrative such as interactive graphs, web-based movies, dynamic tables, infographics, touch-screen gadgets and mobile technology, which allows users to “slice and dice” relevant statistics and swiftly re-publish

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<sup>1</sup> Eurobarometer 83, Europeans and economic statistics report, Spring 2015

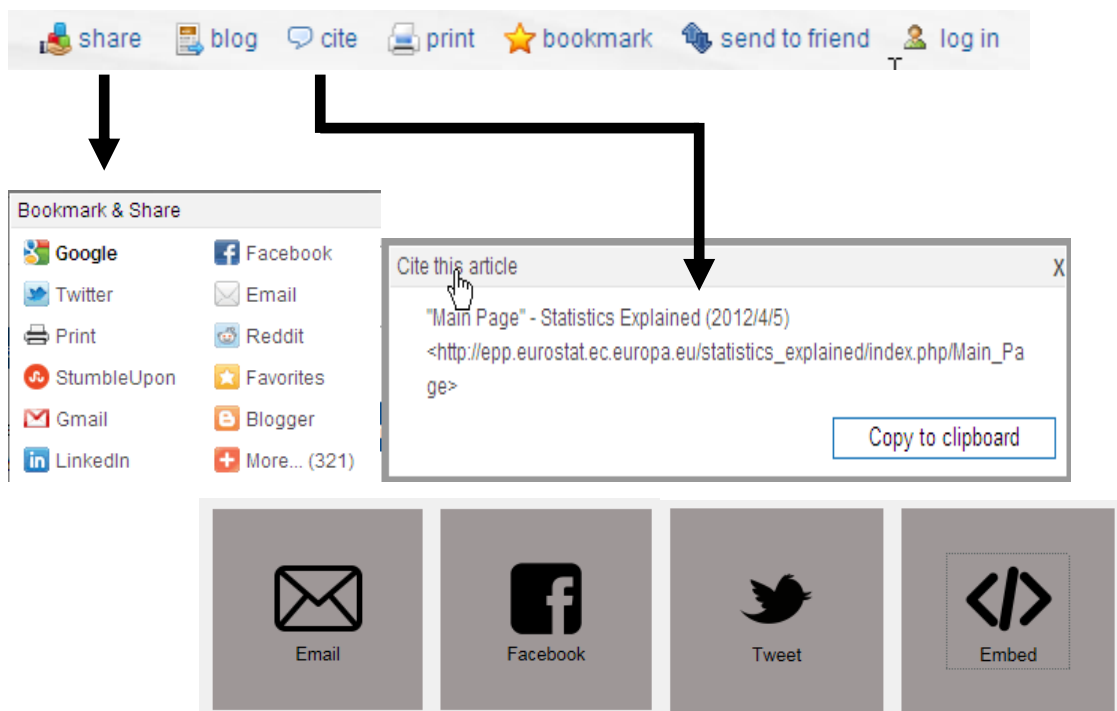
and re-communicate visualisations - without the need for finding the data and reproducing graphs or tables.

Research seems to indicate that our brain can process visual information 60,000 faster than text (3M Corporation, 2001) and that humans are more adept at processing visuals, as approximately 90 percent of all information that comes to the brain is visual (Hyerle, 2000). It has been suggested that human eyes can register 36,000 visual messages per hour (Jensen, 1996) while earlier research suggests that it takes approximately 1/4 of a second for the human brain to process and attach meaning to a symbol. In contrast, it takes the human approximately 6 seconds (a factor of 24) to read 20 to 25 words (Thorpe, S., Fize, D. & Marlot, C. 1996).

While the research itself can be disputed and should be taken with “a grain of salt”, it nevertheless seems to support the idea that presenting statistics visually is easier to comprehend and remember than data presented as tables, numbers and words.

One simple and effective digital tool is the use of widgets to share and cite statistics, which can easily be included within the respective websites.

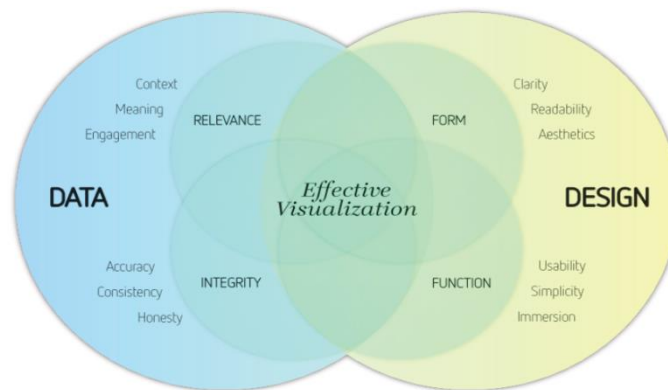
Graph 1: The use of widgets is a cheap and effective way to support users in sharing and cite statistics.



In particular, the embed function allows professional users to re-use visualisation in other digital media and write a short accompanying text presenting the visualisation.

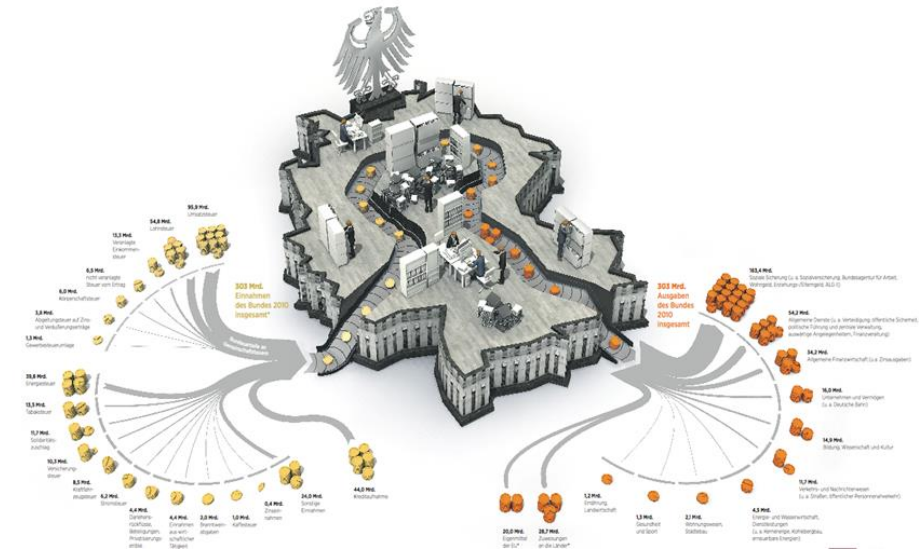
The concept of visualisation requires multi-fold skill sets and collaborative efforts between statisticians and other professionals such as designers. The statistician understands the narrative and the designer clarifies and creates the visual to get the core message across to the reader.

Graph 2: The concept of digital visualisation (Source: Interactivethings.com)



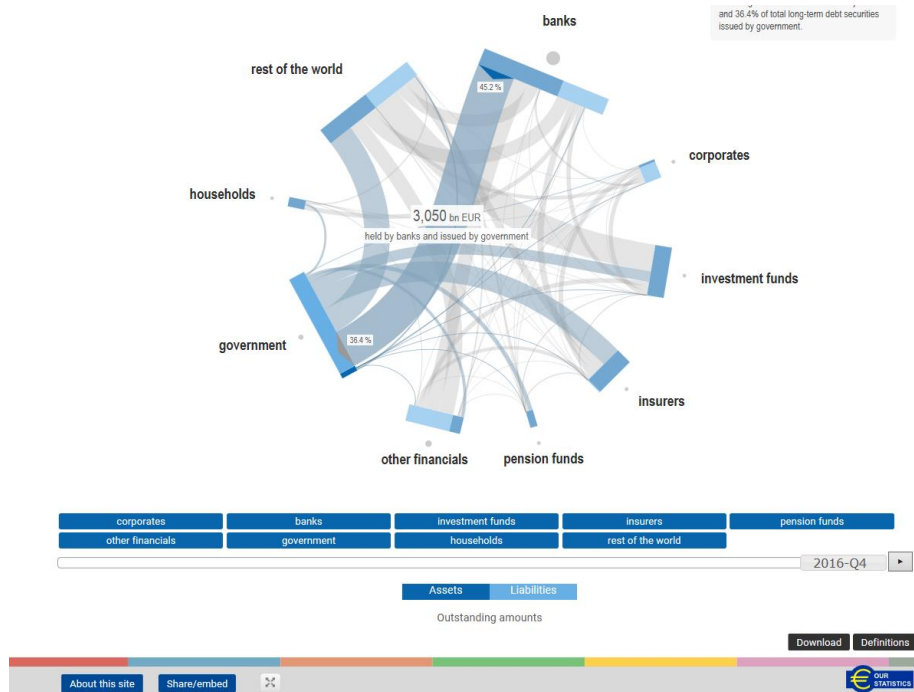
While statisticians may know which types of charts and scales can be used for which sets of statistics, the complexity goes much deeper. Other considerations include the meaning and use of multiple colours, backgrounds, patterns, clockwise presentations, placement of large values and shares, naming of legends, slicing of charts, use of maps, lines and borders. The designer helps a statistician to present a message that catches the viewer's eye and provides a relevant overview of the statistics, while creating an interesting design and hopefully tweaking the reader's curiosity to continue exploring.

Graph 3: The concept of applied visualisation. Example of presenting a complex set of statistics. Where does the money come from and where does it go? (Source: Handelsblatt)



Digital media are important tools in presenting statistics and help journalists and commentators provide near real time news, insight or automatic newsfeed for their customers.

Graph 4: The concept of applied visualisation. Visualising a complex set of statistics. The Financing and investment dynamics – an interactive visualisation of the “who-to-whom tables”. (Source: Our statistics website).



### 3. Visualisations – A collaborative framework for a digital statistics communication strategy

One aim of using digital visualisation is to build a sense of community between statistics and their users. The OECD has created several social networks on, for instance, measuring progress<sup>2</sup>, gender equality<sup>3</sup> and children<sup>4</sup> and 90% of the people on these social networks do not work for the OECD, but rather volunteer their time to share their knowledge on a subject. Eurostat is also using Internet (wiki) technology, but to a different end. The aim of Eurostat, with its platform Statistics Explained<sup>5</sup>, is to create a publishing platform for the general public in multiple languages containing easily understandable statistics.

The statisticians need to embrace these technical and social opportunities and to interact and share tools with other statistical organisations. This is important as we are all engaged - both national and international organisations - in making official statistics known, used and trusted. Furthermore, we already have significant statistical knowledge, know-how and resources within the statistical community which could be adjusted and shared with other statistical organisations with minimal effort. We are even more privileged to have structured production facilities and similar standardized data models and coding systems and data exchanges. Statisticians need to exchange and share tools and add-ons which can be plugged into any other standardised release facility.

A new statistical collaboration model builds on the current knowledge and synergies of statistical organizations and would allow core platforms to be shared with other statistical organizations providing significant time-to-market facilities. The members of the collaborative model will become the specialized and knowledgeable experts in this field and will follow market developments to maintain leading business knowledge of trends and tools on behalf of the statistical community.

The impact will be that each statistical organizations will have a pool of specialists to draw upon to accelerate the learning curve to gain and maintain the knowledge of certain specialized market segments, tools, standards and technology.

For instance, why should each statistical organization develop (and maintain) its own (and similar) mobile application for Apple, Android and Windows respectively in disseminating statistics? Could the participating statistical organization allocate/share the business and development work with other statistical organizations and then make these applications available to the entire statistical community? If such an application is developed and re-used by other statistical organizations with local adaptations, it would be much more cost efficient for statistical organizations to develop and

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<sup>2</sup> [www.wikiprogress.org](http://www.wikiprogress.org)

<sup>3</sup> [www.wikigender.org](http://www.wikigender.org)

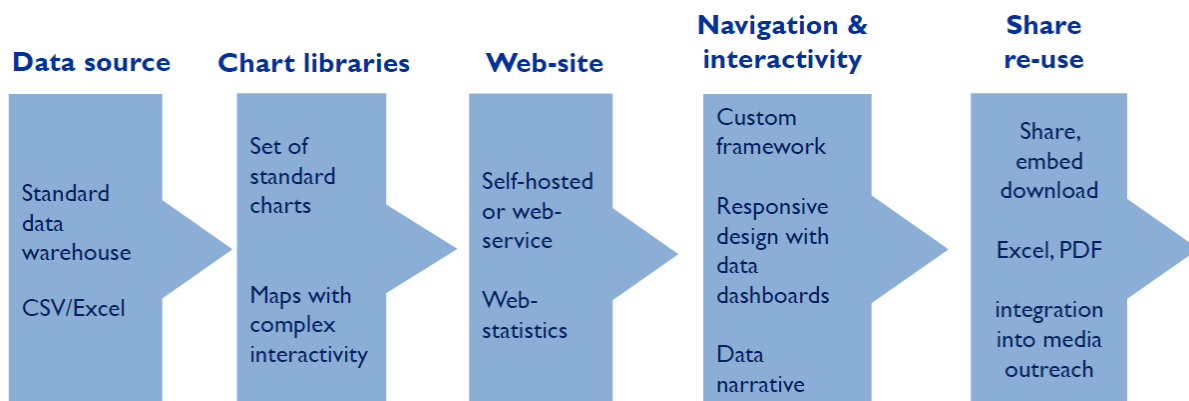
<sup>4</sup> [www.wikichild.org](http://www.wikichild.org)

<sup>5</sup> [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/Main\\_Page](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Main_Page)

maintain their own application(s) and knowledge of various market standards. This also relates to exploring market practices, conducting potential procurements, bidders and selection processes and mapping statistics to information graphics. This is very much a missing statistical business concept and would provide additional knowledge, experience and expertise to develop and promote the use of statistics.

This new collaborative model will allow statistical organizations to offer a wider range of platforms and tools to access and use statistics without having to make the necessary investments in specialized technical fields and their associated constraints on resources and maintenance costs. Furthermore, it may also provide time-to-market results as new platforms become available to the statistical community<sup>6</sup>.

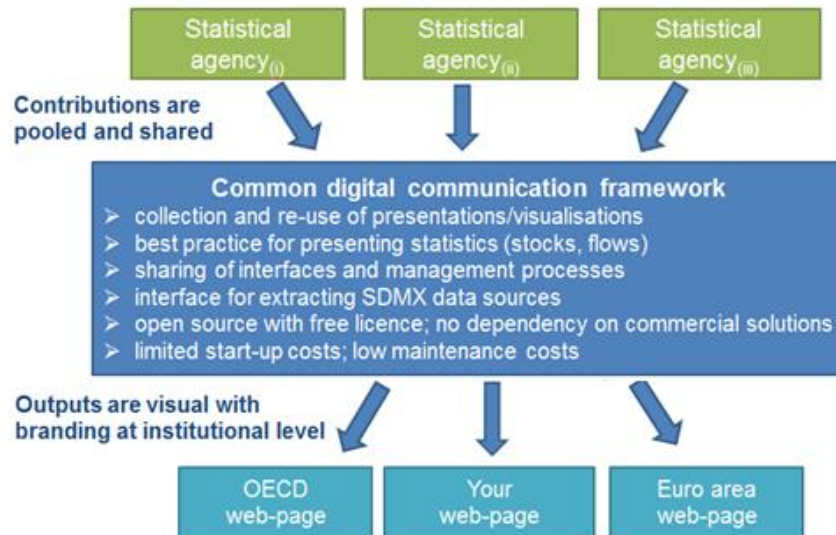
Graph 5: A collaborative framework for visualising statistics. A common set of visualisations and working processes for the statistics community as applied by the OECD and ECB.



<sup>6</sup> This collaborative model has been applied by the OECD and ECB (ref. [www.compareyourcountry.org](http://www.compareyourcountry.org) and [www.euro-area-statistics.org](http://www.euro-area-statistics.org)).



Graph 6: National and international statistical agencies share the common objective of communicating statistics. Share a digital communication concept and framework, where statistics agents benefit from the synergies, saving time, costs and time-to-markets.



#### 4. Preliminary conclusions

The challenge of the statistical community lies in the ability to proactively extract relevant statistics and visualise these in explaining and comparing the structure and dynamics of our society in context and in a way that can be swiftly understood and re-used by the professional users as well as citizens. Professional users and citizens will more readily understand and re-use quality statistics when provided with visual and digital narratives.

The development of digital visualisation and the speed, scope and manner in which digital communication travels has radically changed and provides low-cost and fast collaborative infrastructures in ways that only large corporations could have accomplished in the past. This suggests that users are changing their patterns on how to look, use and share statistics and there seems to be a growing gap between how statistics are presented to society and the way the growing digital community behaves, collects, uses and re-uses statistics.

Furthermore, the increasing volume of data poses a supplementary risk. Finding the relevant statistics of sufficient quality is becoming more complex and time consuming, as news become intraday and is swiftly redistributed via multiple digital channels with a short life span.

This paper argues that the statistics community needs to become proactive and use visualisation platforms as a powerful digital tool. In addition, the paper raises the discussion that national and

international statistical agencies may have a common interest in rendering their statistics using shared visualisation tools and forms to users and therefore benefit from the synergies by contributing to a common (digital) communication visualisation framework, as part of saving costs, time and time-to-markets.