

What role should NSSs play to stay relevant and respond to the needs of citizens and decision makers in a modern economy?

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Views expressed in the presentation do not necessarily coincide with those of the
Banque de France

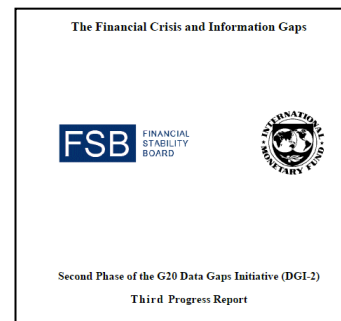
Outline

- **Official statistics were and remain key to many stakeholders**
- **The statistical world has changed: more information, more difficulties, more opportunities**
- **NSS should take the opportunity to adapt to the new environment, using adapted tools, and remain cautious about the limitation of unstructured data**

Official statistics were and remain key to many stakeholders (1/2)

■ Official statistics are a democratic issue, since they allow the evaluation of public policies

- Consider the needs of users
- Data quality is warranted
- Filling in data gaps (cf. G20 IMS FSB Data gaps initiatives)



■ Stakeholders include:

- Policy makers...
- But also journalists, students, researchers, the general public and other data producers

■ ESS quality declaration (2016) aims to demonstrate the comparative advantage of European official statistics

- Independence
- Transparency
- State-of-the-art methodology
- Declaration as it is a strong commitment of all ESS members
- Cf. peer review of European statistics (2014, 2015)



Official statistics were and remain key to many stakeholders (2/2)

■ Some initiatives aim at quantifying the value of official statistics

- Reasons: budgetary constraints, the challenge of large data, increased demand for statistics and higher competition
- Recommendations include: a generalization of the client approach, leveraging on their comparative advantages, improved innovation, strategic partnerships, increased visibility, data sharing and pedagogy

■ Central banks are especially concerned:

- Wide range of statistics (Monetary and financial statistics, Balance of payments, Business climate and economic forecasts, Payment systems and oversight of financial systems, Supervisory and financial markets statistics, Household and corporate finance, etc.)
- Produced with and for many stakeholders (European System of Central Banks, Committee on Monetary, Financial and Balance of Payments Statistics, etc.)

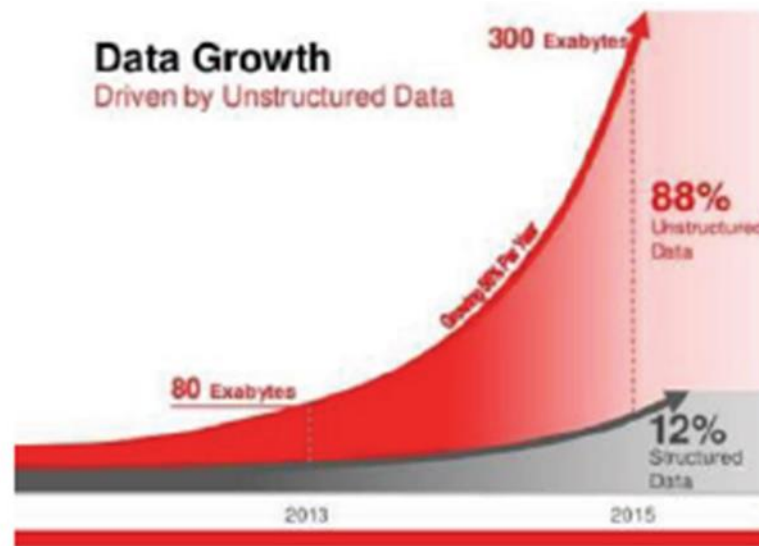


- In a competitive market with a strong commitment to the public

The statistical world has changed: more information, more difficulties, more opportunities (1/3)

■ Our statistical world has changed

- Every single second, 30 terabytes of information are exchanged
- Economic agents are globally interlinked; the digital revolution allows them to take decisions, act and counteract instantaneously
- Institutions cannot prevent the risks stemming from networks and interconnected agents through some low-frequency aggregate figures computed independently from each other



The statistical world has changed: more information, more difficulties, more opportunities (2/3)

■ A general approach to Big Data and data science

- The use of large databases is difficult: storage, data snooping, relevance of Euclidean distance for large dimensions, granularity of samples, interpretability of results, etc.
- Preferred methods include: regularization methods (Lasso), Bayesian approaches, the use of dynamic or static factors, clustering and classification methods (k-means, close neighbors)
- These methods can introduce nonlinearities. To remedy this simply: the use of visualization methods, a measure adapted to large dimensions, intrinsic measures of dimensionality (Taken's theorem), and methods for evaluating the correct time interval

■ Social indicators based on big data nevertheless suffer from certain limits:

- No sampling strategy, only sectoral representativeness in most cases
- Questionable quality and relative heterogeneity
- Web data present significant limits in term of quality (such as outliers, structural breaks or seasonal patterns) and transparency
- Official data should always be preferred over first estimates based on those data, which provide only provisional data

The statistical world has changed: more information, more difficulties, more opportunities (3/3)

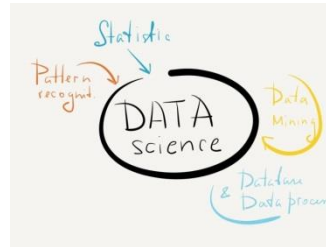
■ Innovative methods are used by the Banque de France:

- Web scraping techniques

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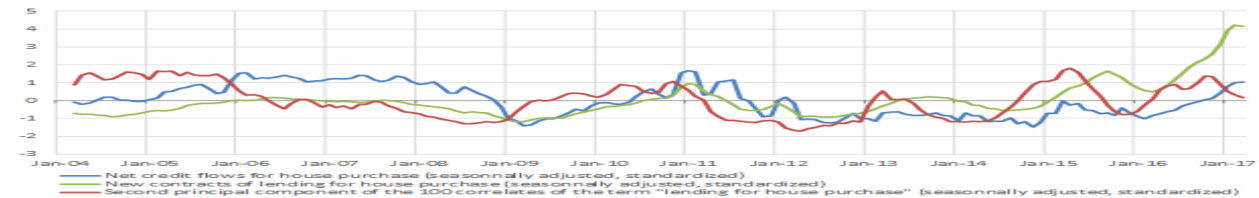
4.1 Compte de résultat de l'exercice 2015

Présentation	2015	2014
Produit net bancaire	42 938	39 168
Frais de personnel	(10 061)	(14 801)
Autres charges générales d'exploitation	(11 539)	(10 157)
Dotations aux amortissements et aux dépréciations	(1 054)	(1 500)
RÉSULTAT BRUT D'EXPLOITATION	13 084	12 644
Coût du risque	(3 797)	(3 705)
Coûts relatifs à l'accord global avec les autorités des ...	(100)	(0 000)
RÉSULTAT D'EXPLOITATION	9 787	2 939
Quote part du résultat net des sociétés mises en éq.	589	407
Gains nets sur autres actifs immobilisés	999	155
Écart d'acquisition	(993)	(351)
RÉSULTAT AVANT IMPÔT	10 379	3 150
Impôts sur les bénéfices	(3 335)	(2 643)
RÉSULTAT NET	7 044	507
dont intérêts minoritaires	350	350
RÉSULTAT NET, PART DU GROUPE	6 694	157
Résultat par action	5,14	(0,07)
Résultat dilué par action	5,13	(0,07)



En millions d'euros	Exercice 2015	Exercice 2014
Intérêts et produits assimilés	41 381	38 707
Intérêts et charges assimilés	(1 8 828)	(1 8 388)
Commissions (produits)	13 335	12 001
Commissions (charges)	(5 720)	(5 273)
Gains nets sur instruments financiers à la valeur de ...	6 054	4 651
Gains nets sur actifs financiers disponibles à la vent ...	1 485	1 069
Produits des autres activités	38 280	35 760
Charges des autres activités	(33 058)	(30 899)
PRODUIT NET BANCAIRE	42 938	39 168
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- The incorporation of new indicators such as Google Trends into econometric models



- Advanced machine learning techniques in the field of macroeconomic forecasting
- Developed nowcasting techniques (providing estimates of official statistics even before they are published) making it possible to take economic policy decisions in real time

NSS should take the opportunity to adapt to the new environment (1/5): data as an opportunity

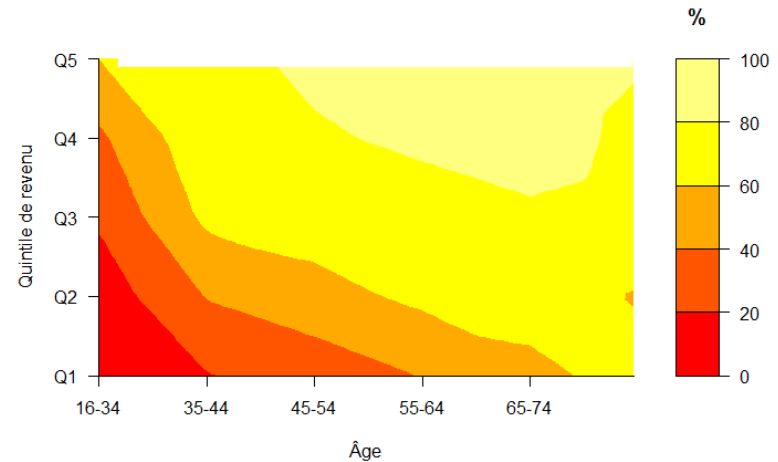
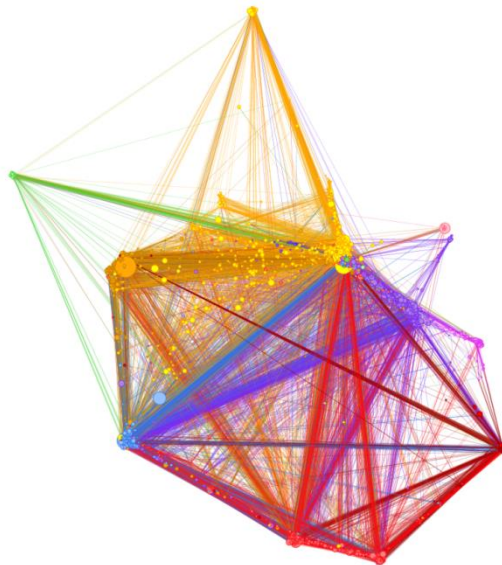
- **Big data and data science are not a threat to public statistics, but an opportunity**
 - Better allocation of resources
 - Limit the costs for data production, storage and release, restraining investment in IT infrastructures
 - Relying on networks and decentralized information transmission channels
 - Support new communities: the case for the R-Data Science community inside the Banque de France and “Le Lab”



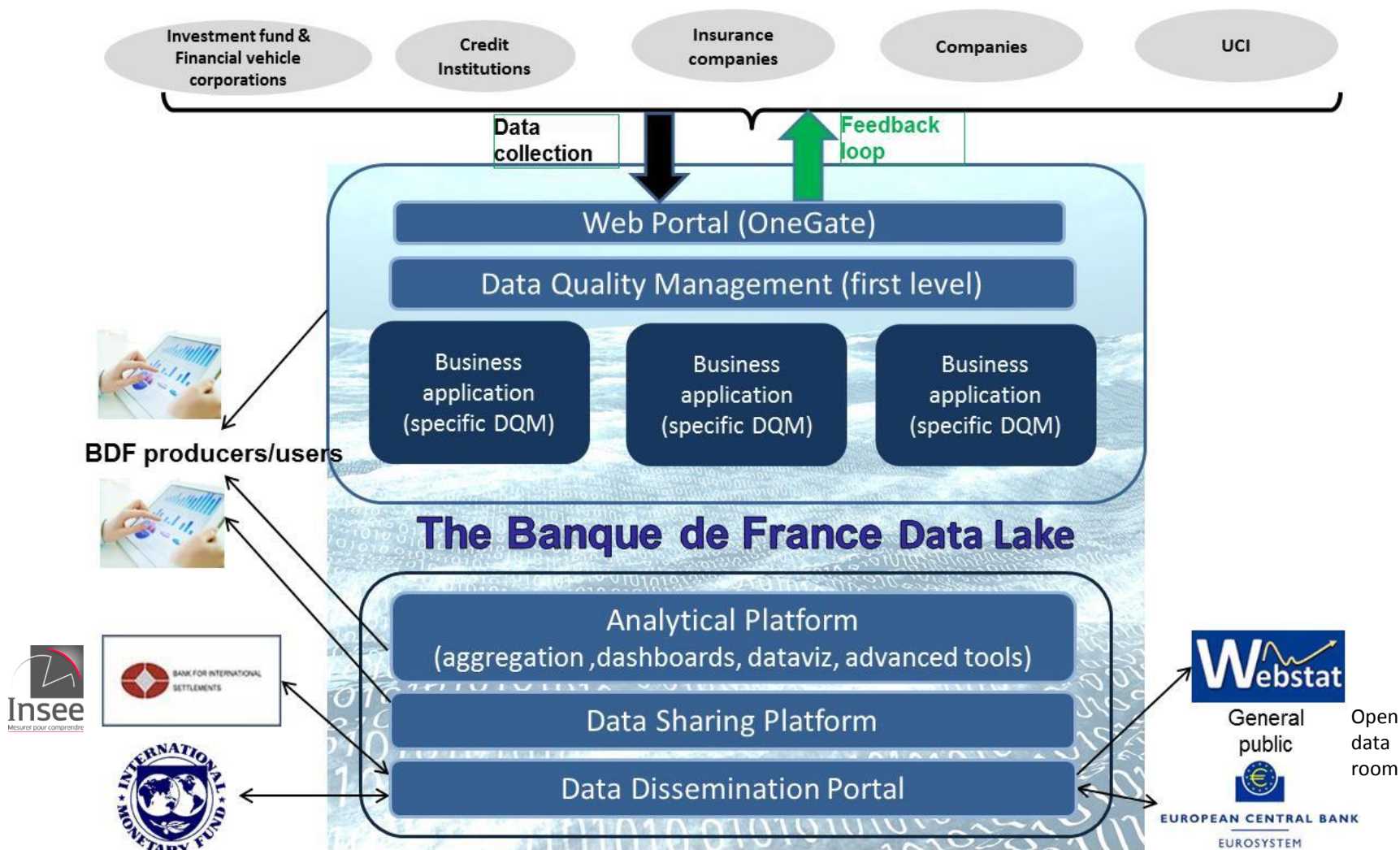
- Statistical techniques also authorize public authorities to handle and exchange information while respecting confidentiality issues. Indeed, the protection of personal data must be considered as a major issue, especially regarding the implementation of the European regulation (GDPR).

NSS should take the opportunity to adapt to the new environment (2/5): enhanced visualization

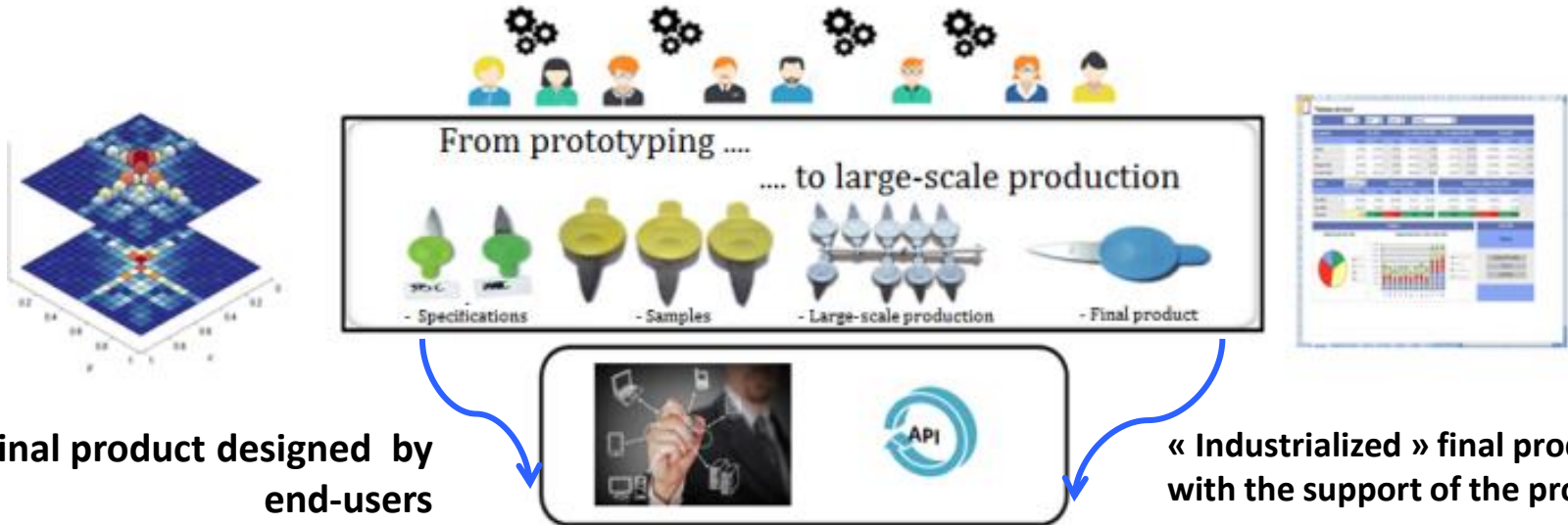
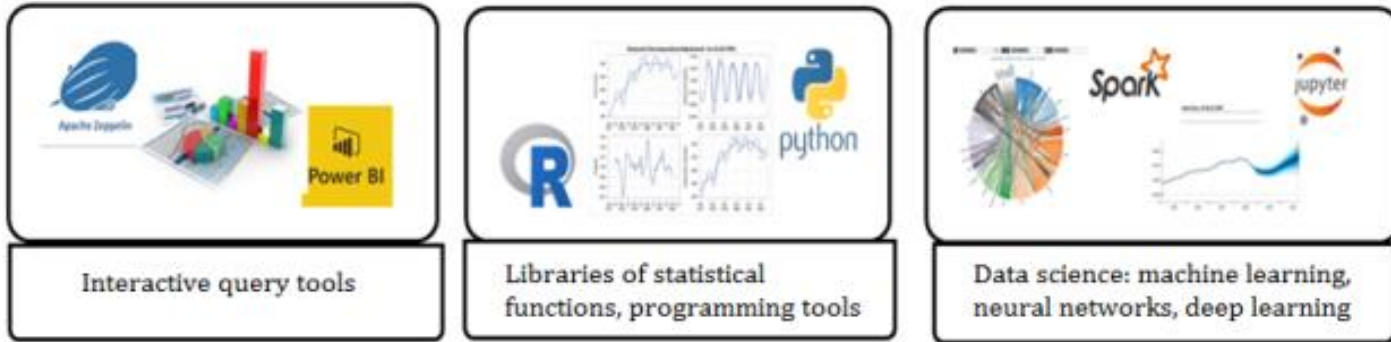
- **Visualization tools allow for more narrative-based communication without compromising vendor neutrality.**
 - The clarity of titles and metadata is key, as is the hierarchy of information, especially for non-experts
 - Data visualization must be integrated into the data management infrastructure, allow for future adjustments, and be the subject of constant long-term communication



NSS should take the opportunity to adapt to the new environment (3/5): data sharing and Data Lake



NSS should take the opportunity to adapt to the new environment (4/5): the Data Lake analytical platform



NSS should take the opportunity to adapt to the new environment (5/5): data reliability

- **Public authorities are at the heart of data sharing, as they both analyze and compute the data.**
 - They are all the more at the forefront of data making than they release data of a very important and specific type
 - Official statistics are not necessarily more frequent than those released by private providers
 - Official statistics are not necessarily broader or more detailed
- **Official statistics are reliable.**
- **Public authorities play a major role in data sharing: their responsibility is to release and open access to data of high quality that people can trust.**

Conclusion

■ **Big data is a major innovation**

- Responsibility of official statistics: make use of big data when it comes to filling a statistical gap, but with the appropriate tools, which are significantly different from those of official statistics
- Keeping in mind the limits specific to these new data sources

■ **Leadership qualities that can be expected from heads of statistical authorities are**

- A clear view of data as a public good and how data supports the progress in social science
- Openness to diverse new actors and new technologies for an appropriate treatment of data

Thank you for your attention!