

Developing Corporate Analytics in ONS United Kingdom

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Introduction

National Statistics Institutes (NSIs) across the world are working in an environment of increasing complexity, increasing pressure, and increasing competition. In this environment, it is important for NSIs to operate as high performing organisations and to manage themselves in a way which any professional organisation would aspire to.

An important part of this is to understand organisational performance and to enable business decisions to be taken around operations using management information, Key Performance Indicators (KPIs) and effective corporate analytics.

The provision of corporate performance information enables organisations to understand whether they are on track toward their stated objectives. Well-designed corporate performance data and KPIs are vital navigational instruments, giving a clear picture of current levels of performance and whether the business is where it needs to be. They are also useful decision-making tools. KPIs reduce the complex nature of organisational performance to a small, manageable number of key indicators.

However, developing an effective system of organisational performance is not a simple matter, it includes a complex interface between data, tools, systems, skills and techniques which must develop in parallel to build a modern and effective corporate analytics and reporting approach.

This paper gives a brief overview of the efforts made at the UK Office for National Statistics to establish an effective system of organisational performance and corporate analytics, focussing on three areas:

1. Establishing a Corporate Analytics Vision
2. Measuring the Right Things
3. Using Modern Tools and Techniques

The paper describes a journey to improve corporate analytics. It is important to note that this journey is not yet complete but significant progress has certainly been made.

1. Establishing a Corporate Analytics Vision

For any change project it is important to create a vision which can engage all stakeholders and provide a joined-up view of strategic direction. Having such a vision can clarify how the future will be different from the past and how people can make that future a reality through initiatives linked directly to the vision.

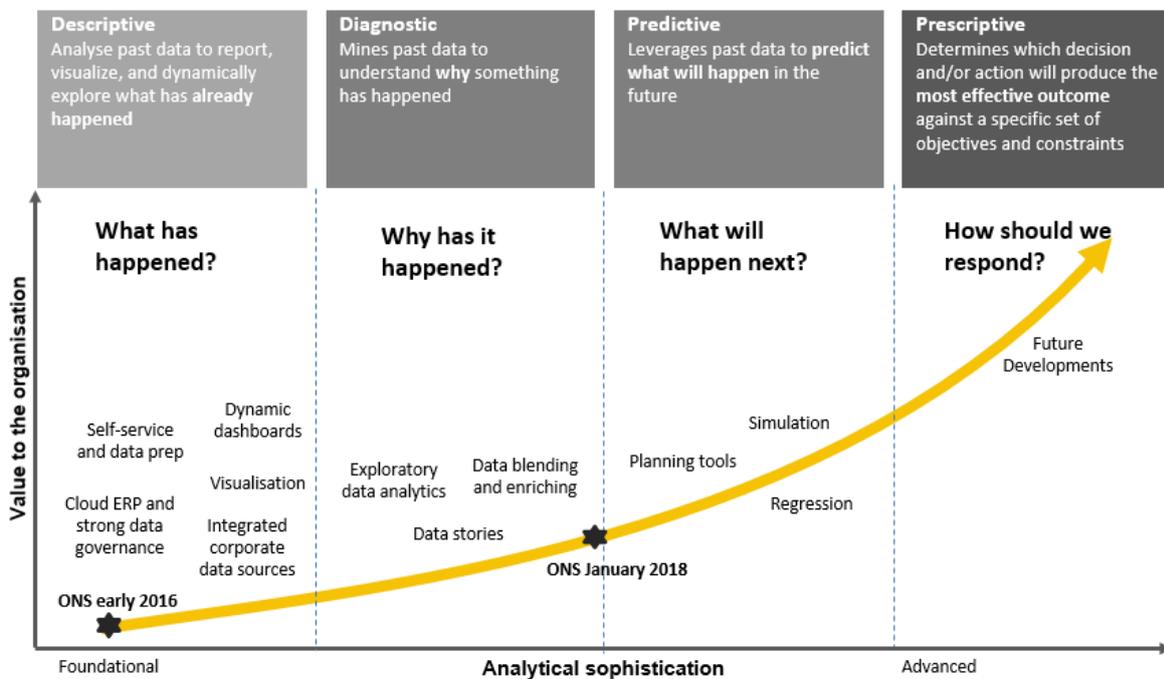
At ONS we recognised the need for better decisions on organisational performance at a time of complexity and transformation, we also recognised it was essential to deliver improvements to corporate analytics through a multi-disciplinary team. The performance of an organisation cuts across many functions and professions, particularly Finance, Human Resources and other corporate functions, as well as statistical production, operations and quality management areas.

The development of a single joint vision was essential to driving change across different areas as it aligned this broad team around who they wanted to become together, and prompted others to raise their hands to help make it happen.

The ONS vision for corporate analytics was to move from a position where corporate data was used to look back at past trends (a descriptive approach) to one which determines which action will produce the most effective outcome in the future (a prescriptive approach).

Developing such a model takes focus over time on iterative improvement, as shown on the maturity curve in figure 1.

Figure 1: ONS Vision for Corporate Analytics



The maturity curve shows a journey from building the foundations needed, to the delivery of increased value as a result. In two years ONS has raised its maturity significantly with the introduction of dynamic dashboards, better visualisation, data governance, and data

blending and enriching. However, we still have some way to go to fully mature our approach to corporate analytics.

2. Measuring the Right Things

Mark Friedman, in his Results Based Accountability approach, suggests that all performance measures fit into one of four categories, derived from the intersection of quantity and quality vs. effort and effect, as per the table below.

	QUANTITY	QUALITY
EFFORT	<i>How much did we do?</i> How much service did we deliver?	<i>How well did we do it?</i> How well did we deliver the service?
EFFECT	<i>Is anyone better off (#)?</i> How much change for the better did we produce?	<i>Is anyone better off (%)?</i> What quality of change for the better did we produce?

Friedman also indicates that not all performance measures are of equal importance. There are two general classes of performance measures that are most important:

1. those that tell whether the service and its related functions are done well (upper right quadrant). These measures include such things as timeliness of service, accessibility, cultural competence, turnover rate and morale of staff. These measures are used by managers to steer the administration of the program. If things are late, they work to make them timely. If turnover is high, they work to retain staff.
2. those that tell us whether our customers are better off as a consequence of receiving the service (lower right quadrant). These are measures of "client or customer results", measures that gauge the effect of the service on people's lives.

The question we asked ourselves at ONS was whether our organisational measures of performance were really getting to the heart of the issue, were they too heavily located in one area and missing the impact that ONS has on changing the outside world for the better?

As NSIs the impact we have is not easy to measure but if we can focus our KPIs on outcomes and results we can try to get to the heart of our value. We recognised it was difficult for us to measure 'population accountability', that is accountability for the well-being of a whole population (as this is bigger than one organisation and removed from the direct line of sight of ONS), however it should be possible to measure 'performance accountability' that is the impact of ONS (or other statistical organisations) on the well-being of the client population (those who receive the service and benefit from ONS outputs).

As we developed our business plan for 2018/19 to 2020/21 (published in April 2018) we focussed on some of these challenges and included KPIs and other measures which seek to get to the heart of this challenge and to measure the performance and impact of ONS.

Appendix A shows these measures. Our KPIs and operational measures form the basis of our monthly reporting on performance, in essence they are how we hold ourselves to account for delivery against our plan.

Although these measures give a rounded view of organisational performance, we recognise we still have some way to go to really get to the heart of the question of impact or value. This

will always be a struggle for NSIs when our work is several steps removed from the direct impact we have on the economy and society.

3. Using Modern Tools and Techniques

Early in our journey to improve corporate analytics we realised we were limited by the tools we had available for data management, processing and visualisation. Most of our corporate analytics work was Excel based, meaning we were limited from creating interactive dashboards, from automating processes, and from producing innovative visualisations of corporate data.

We therefore identified new tools needed to drive improvement and acquired Alteryx for data processing and Tableau for visualisation. Both tools have enabled us to fundamentally transform the way our corporate analytics work, creating efficiencies through the automation of processes and allowing staff time to be dedicated to value added work, providing analysis and insight. Figure 2 shows how our approach has shifted, using modern tools to enable a change in the way we operate.

Figure 2: ONS Corporate Analytics Tools



Changing customer expectations - decision makers expect Corporate Services professionals to dig deeper into what's happening across the organisation; to use data to **optimise** the business and **drive innovation**. This change in demand is reflective of changing expectations across the wider government and private sector landscape.

•**£Savings!** Operational cost savings within the Finance function; and a changing shape for the Finance workforce. Fewer administrative roles; greater numbers of mid-level professional and analytical roles.

•**Value for money** – relatively low costs to implement with immediate and considerable benefits.

•**People engagement** – research tells us that *millennials* do not want to be Excel junkies! ...our future workforce expects to have access to best-in-class visual and analytical tools; while our existing workforce want better tools to perform their roles.

The introduction of these tools was based on the following steps:

I. Discovery: An exercise to evaluate our readiness to promote an analytics culture and form a plan to close the gaps.

II. Prototyping & Quick-wins: A period in which 'power users' were given the support and training needed to become confident analytic champions and use the new tools. This phase

was about developing “quick wins” that prove the value of business-led analytics — and that can be copied and expanded over time. We just ‘started doing stuff’.

III. Foundation Building: Putting in place the processes, structures, and technical infrastructure to support broad adoption. This is where security, data governance, and other policies have started to become more mature and where broad training and enablement is put in place.

IV. Scale Out: Measured roll out of empowered analytics capabilities across the organisation. This is the next step for us.

Using these tools has enabled us to streamline processes and report on organisational performance to various levels within the organisation using interactive dashboards and modern visualisations. Although some investment was needed in skills development the tools are intuitive and the learning curve for people engaged in this work has been quick.

One specific product produced through our maturing approach to corporate analytics is a presentation of our KPIs and measures which are reported, with an update of progress, through a balanced scorecard and detailed performance dashboard each month to our top-level Boards. Where appropriate we underpin the scorecard with dashboards showing underlying data for each measure, including a time series and detail around any specific issues. This report is used to drive discussion and decision making on key organisational performance issues. **Appendix B** shows what our balanced scorecard looks like, note that the data included is not real data due to potential sensitivities.

Conclusion

This paper provides a brief overview of improvements to corporate analytics in ONS. We have come a long way in two years but are only just starting to realise the value of improvements. Through the implementation of new tools, techniques and methods to hold, process and visualise corporate data, and the development of new KPIs and other measures of performance, we have made good progress.

However, it is increasingly clear that these areas are the ‘quick wins’. People and cultural issues are just as important to change and improvement in this area. As we continue to build a collaborative community of analysts who understand organisational performance and can provide insight across different areas and data sets we will further accelerate our maturity and enable the organisation to take effective and timely business decisions.

Appendix B: ONS Key Performance Indicators and Operational Measures

The measures below are published in the UK Statistics Authority Business Plan for 2018/19 to 2020/21. The measures are aligned to the five dimensions in the Authority's Better Statistics, Better Decisions Strategy.

HELPFUL

KEY PERFORMANCE INDICATORS

Customer perception of whether ONS is helpful in improving decision making

Measured through a) Feedback from key customers against product area, b) Year-on-year increase in proportion of customers satisfied with ONS performance, c) Improving public perception of policy issues vs reality measured by ONS and others' research

Data Science Campus outputs adopted

New outputs (products, reports, insights) being used in production and by multiple partners, including across Government

Public Confidence in Official Statistics

2016 Position: 90%, Target: Increase in 2018

OPERATIONAL MEASURES

ONS online end user satisfaction

2017 Position: 76% neutral or positive Target: Year-on-year increase

Help the UK research and innovation community to thrive through increased use of the secure research service

Target: Reach 400 projects run through the Secure Research Service in 2018/19, with value and impact demonstrated through case studies

Media sentiment across print and online

Target: <10% of media stories 'negative'

PROFESSIONAL

OPERATIONAL MEASURES

Proportion of statistical releases free from major errors (ONS)

2017/18 Position: 99.8%. 2018/19 Target: 100%

Proportion of statistical releases within the 09:30 deadline (ONS)

2017/18 Position: 98%. 2018/19 Target: 100%

Response rates for ONS surveys

Target: 90% (business) 56% (LFS)

Significant data breaches or losses

2017/18 Position: 0. 2017/18 Target: 0

Retain National Statistics Status for key outputs and regain National Statistics Status for Trade and Construction in 2018/19

Proportion of ONS systems and processes that are assessed as resilient

2017/18 Position: 86%. 2018/19 Target: year-on-year increase

INNOVATIVE

KEY PERFORMANCE INDICATORS

80% of ONS 'Legacy' IT Systems to be replaced with new technology by April 2020

Data Science Campus methods, processes and techniques used in production

New data sources, methods, code, and other techniques being used in production and by multiple partners

Deliver significant progress towards modernising ONS, including census 2021

Deliver all activities and milestones as outlined for ONS transformation

OPERATIONAL MEASURES

Reduction in reliance on surveys due to the use of alternative data sources

Increased availability and use of acquired administrative and commercial data sources through new ONS systems

EFFICIENT

KEY PERFORMANCE INDICATORS

Deliver our business while achieving annual efficiency savings

19% efficiencies in our core funding by 2019/20, through reductions in our cost base and re-investment

Demonstrate the benefits from Economic Statistics and Public Policy transformations

Tracking the direct and wider economic benefits from ONS transformation programmes and designing a framework to demonstrate the value of the technology and data led approach

OPERATIONAL MEASURES

Achieve set income target

2018/19 Target: £20m to £25m

The number of staff days lost per person across the Authority

2018/19 Target: <7.5

Proportion of business surveys available online

Target: Majority of ongoing business surveys online by March 2020

Estimated respondent time and cost for completing ONS surveys

Target: a) 25% reduction in average processing cost for surveys transformed and online. b) Monetary value of respondent burden, as estimated by ONS, reduces over time

CAPABLE

KEY PERFORMANCE INDICATORS

Level of staff engagement (UKSA)

2017/18 Position: 61%, 2018/19 Target: 65%

Through the Data Science Campus produce 500 qualified data analysts for Government by 2021

OPERATIONAL MEASURES

Share of the ONS workforce who are members of the four Government analytical professions (Statistics, Economics, Operational Research and Social Research)

2015/16 Position: 19% of total workforce

Target: 50% increase by 2019/20

Proportion of new ONS recruits who are analytical professionals

Target: >50% recruits in 2018/19

ONS Learning Academy courses and attendees aligned to priority skills development: analytical, digital, leadership

Appendix B: Example ONS Corporate Scorecard (Dummy Data)

Corporate Performance Report							Office for National Statistics
Helpful	<p>ONS Online end user satisfaction</p> <p>Current Position 96% Previous Year Not Comparable Annual Target 60%</p>	<p>Public Confidence in Official Statistics</p> <p>Current Position Due Autumn 2018 Previous Year 90% Biannual Target 90%</p>	<p>Proportion of Customers who feel ONS outputs are trustworthy</p> <p>Current Position Due Autumn 2018 Previous Year 87% Annual Target 90%</p>	<p>Help the UK research and innovation community to thrive through increased use of the secure research service</p> <p>Current Position 191 projects 2018/19 Target 400 projects</p>	<p>Media sentiment across print and online</p> <p>Current Position 4.7% Target <10% of media stories 'negative'</p>	<p>Data Science Campus outputs adopted</p> <p>See Data Science Campus Dashboard</p>	<p>Customer Perception of whether ONS is Helpful in improving decision making</p> <p>Currently measured through feedback from key customers against product area</p>
	<p>Business Plan Deliverables</p> <p>Current Position 55 G, 3 A/G, 17 A, 1 A/R, 3 R</p> <p>Key Business Plan Deliverables</p>	<p>Number of statistical releases with major errors (ONS)</p> <p>Current Month 0 Previous Month 0 Annual Target 0</p>	<p>Releases Within the 09:30 Deadline</p> <p>Current Month 100% Previous Month 100% Annual Target 100%</p>	<p>Minor Corrections to Statistical Releases</p> <p>Current Month 9 Previous Month 7</p>	<p>Social Survey Response Rate Improvement</p> <p>See Social Survey Response Rates Dashboard</p>	<p>Significant data breaches or losses</p> <p>Current Month 0 Previous Month 0 Annual Target 0</p>	<p>Retain National Statistics Status for key outputs and regain National Statistics status for Trade and Construction</p> <p>Trade and Construction Target 2018/19</p>
Innovative	<p>Deliver significant progress towards modernising ONS, including Census 2021</p> <p>CDCTP: Amber ESTP: Amber</p>	<p>80% of ONS "Legacy" IT Systems to be replaced with new technology by April 2020</p> <p>Current Position To be introduced in October</p>	<p>Data Science Campus methods, processes and techniques used in production</p> <p>See Data Science Campus Dashboard</p>	<p>Reduction in reliance on surveys due to the use of alternative data sources</p> <p>Current Position To be introduced in September</p>	<p>Specific focus on Census 2021</p> <p>Amber based on Programme status. See Census Dashboard</p>		
Efficient	<p>Budget to Full Year Forecast Variance</p> <p>Current Month -3.2%</p>	<p>Achieve Set Income Target</p> <p>Current Month -2.3%</p>	<p>The number of staff days lost per person across the Authority</p> <p>Current Month 7.6 Previous Month 7.5 Annual Target < 7.5</p>	<p>Number of business surveys available online</p> <p>Current Month 82000 Previous Month 61000 Annual Target 410,000</p>	<p>Estimated respondent time and cost for completing ONS surveys</p> <p>2016/17 Position £17M Previous Year Not Comparable Target Reducing over time</p>	<p>Deliver our business while achieving annual efficiency savings</p> <p>Current Position To be introduced in September</p>	<p>Demonstrate the benefits from Economic Statistics and Public Policy Transformations</p> <p>Current Position To be introduced in October</p>
Capable	<p>ONS Learning Academy courses and attendees aligned to priority skills development</p> <p>Course Attendances: 433 Completed Events 30</p>	<p>Employee Engagement Score 2017/18</p> <p>Current Position 61% Previous Year 59% Annual Target 65%</p>	<p>Through the Data Science Campus, produce 500 qualified data analysts for Government by 2021</p> <p>Current Position 126</p>	<p>Share of the ONS workforce who are members of the four Government analytical professions (Statistics, Economics, Operational Research and Social Research)</p> <p>Current % of Posts 28%</p>	<p>Proportion of new ONS recruits who are analytical professionals</p> <p>Current Month 50% Previous Month 28%</p>	<p>Overall Workforce Position</p>	<p>Recruitment of Apprentices in England</p> <p>Current Number 10 Q1 Target 13</p>

Key:

- Green
- Amber
- Red
- Under Development

○ Previous RAG Status*