Alpha - Digital Performance Framework

Welcome to the first draft of the Digital Performance Framework for GDS. This is an 'alpha' draft — there's lots more work to be done and many more resources to be added.

This framework is intended to be 'carrot not stick'. They're not a list of bad things to be avoided, they're a set of principles to inspire you, accompanied by examples which explain things further and resources which will make it easier to follow.

We'd love to know what you think — will this framework and the examples be useful for you? Please let us know via <u>pdu-feedback@digital.cabinet-office.gov.uk</u>.

GDS Digital Performance Framework

Measuring the performance of public services is vital, but it can be difficult to know where to start.

This framework is for product managers and teams in the public sector responsible for designing and improving transactional public services. It's an illustration of how we approach performance management for the services like GOV.UK.

See this blog post for an overview of the framework and other useful links.

- 1 Understand user needs and business objectives
- 2 Decide what to measure and how to measure it
- 3 Install and configure platforms
- 4 Establish a baseline and benchmarks
- 5 Collect and aggregate data
- 6 Analyse and visualise data
- 7 Monitor, iterate, and improve

1 - Understand user needs and business objectives

In order to improve the performance of a service, or demonstrate its success, you have to be able to identify what information different audiences will need to analyse that performance.

There is typically a pyramid of interested users, all of whom will have different metrics for success. Technical staff might have operational and optimisation concerns, while senior management and ministers will have more strategic and comparative concerns.

Understanding these different users needs and business objectives provides the basis for developing meaningful and actionable performance metrics.

Checklist

- a. Have you identified who your users are?
- b. Have you articulated your users' needs?
- c. Have you written specific and measurable business objectives?
- d. Have you prioritised services (e.g by number of users or cost)?

Example

The table below illustrates some typical user needs and objectives:

User	Objectives	Questions
<i>Senior officials</i> : Ministers, Dept. Boards, the 'Centre'.	Risk management; maximise digital uptake; ensure value for money; control or reduce overall spend; public celebration of success.	How does this compare with other services on cost per transaction? What do users think of our services? How can we increase the number of people using the service digitally?
<i>Management</i> : Senior Responsible Officers, Middle management, product managers.	Minimise failed transactions; control queues; hit budget target; optimise staffing levels; accurate financial and performance forecasting.	What are we likely to spend by the year-end? How can we drive down channel costs?
<i>Operational</i> : developers, frontline staff.	Maximise service availability; minimise latency; minimise errors; minimise broken links; ensure search results are relevant; ensure domain is secure and handles customer data properly.	Is the service operating normally? Why are <u>bounce rates</u> so high on the homepage? Who are our users and what do they need?
The Public	To know how public money is being spent; to know well public services are being run.	How much money is the Government spending on public services? What is the cheapest way to deliver public services?

2 - Decide what to measure and how to measure it

Develop simple to understand, actionable and easy to collect metrics based on your understanding of users needs. Identify where that information will come from.

Key Performance Indicators (KPIs) will be few in number, and are top-line indicators of how well you are doing against your business objectives. There will be many other, more granular metrics that will be useful for different audiences.

It's good practice to record every event generated by the system even if not currently of interest. Don't obsess over 'what shall we measure': measure everything.* This maximises the flexibility to come back later and revise the chosen metrics.

*This information could come from a variety of sources, for example Oracle and Excel for finance databases, Google Analytics for testing and optimisation tools, or Nagios and Pingdom for system monitoring (*example software is illustrative*).

Checklist

- a. Have you developed metrics and Key Performance Indicators (KPIs)?
- b. Are your metrics actionable, simple to understand and easy to collect?
- c. Have you mapped your metrics to the relevant audience?
- d. Have you identified where your metrics will be sourced from?
- e. Do you know how frequently performance information is required by your users?

Example



An approach that worked well for us was to run brainstorming sessions using business objectives as prompts: Simpler, Clearer, Faster, Savings, Innovation. This generated a long list of metrics which we then narrowed down by asking senior managers, 'If you had to choose one KPI, what would it be?'

Example

The following example expands on the example in Step 1.

User	User story	Action	Metric or KPI	Format	Data source
Management:	I want to know how much	Implement a	Costs by	Monthly	Finance,
Senior Responsible	it is costing to deliver a	channel shift	channel,	report	Operations
Officers, Middle	specific service by channel	initiative			

management,	so that I can drive costs				
product managers.	down				
Management:	I want to know how many	Work with	Failure rate	Daily	Web
Senior Responsible	attempted transactions	developers		dashboar	analytics
Officers, Middle	resulted in failure for a	to test an		d	
management,	specific service so that I	alternative page			
product managers.	can quickly act to improve	design to see if			
	the service	it reduces the			
		failure rate			
Operational:	I want to know if the service	Investigate	Uptime or	Realtime	System
developers,	becomes unavailable so	cause and	Mean time	alert	monitoring
frontline staff.	that I can take immediate	resolve problem	between		
	action to restore it		failures		
			(MTBF)		
Operational:	I want to minimise the	Investigate	Number of	Daily	Logs
developers,	number of broken links so	cause and	broken links	dashboar	
frontline staff.	that the user experience is	resolve problem		d	
	error free				

3 - Install and configure platforms

Install and configure reporting platforms that meet your needs. Where possible, use platforms that enable the data to be piped automatically into other systems. Using APIs (Application Programming Interfaces) will stop you having to input data manually and allows for aggregation across multiple platforms.

There are a number of open source products available as well as paid alternatives. If you are using a third party supplier, ensure that you have access to the raw data behind the measures specified in the contract or SLA and make sure data is not thrown away after a short period of time.

Checklist

- a. Have you installed web analytics software?
- b. Have you configured your web analytics software with the appropriate conversion funnels?
- c. Do you have the capability to run user satisfaction surveys?
- d. Do you have the capability to do <u>A/B testing</u> and <u>multivariate testing</u>?
- e. Do you have software installed for monitoring server uptime and performance?
- f. Can you generate custom performance data based on system-generated events?

Example



Further reading

- Occam's Razor is an excellent blog by Avinash Kaushik with loads of useful advice on metrics, KPIs and analytics. See for example this <u>article on how to set good performance indicators</u>.
- The <u>Google Analytics Help Centre</u> is a useful resource if you use that particular platform, see for example this <u>guide to setting up goals and funnels</u>.
- Blog article with a good discussion on user flows and conversion funnels.

4 - Establish baselines and benchmarks

Based on current performance trends, establish a 'baseline' against which changes to the service will be judged. This will help you to pinpoint the effect of your initiatives, and identify which have worked and which have not. Adopt standard methodologies for reporting and analysis wherever possible.

Benchmarking against other products and services or other sectors can also provide a useful context for judging performance. Adopting standard methodologies, like the <u>Customer Satisfaction Index</u> or <u>Net Promoter Score</u> for customer satisfaction metrics, ensures that you can accurately compare your performance to those other products and services.

Whichever method you choose, get feedback from your users and make improvements based on this feedback.

Checklist

- a. Have you measured how your current performance is trending?
- b. Have you asked your customers what they think of the service?
- c. Have you compared your performance with industry benchmarks?

Example



5 - Collect and aggregate data

Collect and aggregate performance information from multiple sources and across multiple channels. Make sure you understand what this will mean in terms of system requirements.

Combining this data brings useful insights, for example into service efficiency (e.g. cost per transaction) or proportional usage by channel (e.g. percentage digital uptake).

Be aware though that combining data from different data sources can lead to huge storage requirements: large, data-driven organisations now talk about storage in terms of petabytes, the equivalent of one million gigabytes.

There are solutions to this problem already in place. For example, the <u>Hadoop</u> software framework was developed to enable collection, aggregation and querying of such huge data stores, and is based on <u>work</u> <u>done by Google</u> and Yahoo to develop search engines.

Checklist

- a. Have you collected data on costs, usage and performance?
- b. Have you collected performance data from digital and non-digital channels?
- c. Do you know how many people use the service, by channel?
- d. Have you aggregated performance data to enable it to be easily combined?

Example



6 - Analyse & visualise data

Communicate performance information to your users through the appropriate dashboards, reports and alerts. Highlight specific segments that are known to be of interest to your users, and make sure that your visualisations are simple, actionable and contain minimal amounts of <u>chart junk</u>.

Typical segments include:

- **Channel used to access service:** through which channel(s) did the user find out about and attempt to use the service?
- New vs. repeat visitors: are first time users behaving differently to those who have used the service before?
- **Geographical region:** how popular is the digital service by region and how does that compare with online penetration in general?
- **Product type:** is the user experience different depending on the type of product or service being used?
- Value: is performance dependent on the monetary value of the product or service being sought?

Communicate performance information to your users through the appropriate dashboards, reports and alerts: **Dashboards** are objective-focused and will help inform decisions, often with the help of real-time data; **Reports** provide regular, scheduled snapshots of data and tend to require extra context and time to digest; **Alerts** are used to inform the users about a change or an event, often using attention-grabbing delivery mechanisms.

By making sure your visualisations are clear and visible you maximise the likelihood that the information will be acted upon and services thereby improved. Best practices include:

- keeping charts plain: don't use shading, 3D and other effects
- removing clutter: don't use trend lines, grid lines, unnecessary labelling
- not using pie charts: they require more space and are harder to read than bar charts
- using text where a chart adds nothing: don't use charts

Checklist

- a. Have you done any segmentation (i.e. analysed performance data by segment)?
- b. Have you designed the appropriate dashboards, reports and alerts?
- c. Are your data visualisations visible to their intended audience?
- d. Have you followed best practice design principles for data visualisation?

Example

GOV.UK developer dashboards

GITHUB ACTIVITY		16	21	
JAMES STEWART PUSHED TO RUMMAGER Tweak to try and get JSON links into search page headers		bugs	24	velocity
JAMES STEWART PUSHED TO FRONTEND		STRIP TRAILING WHITES	PACE IN	
JAMES STEWART PUSHED TO FRONTEND	A DAY AGO	PRINT STYLESHEETS SEI		
Return HTTP 406 if asked for KML of a publication that doesn't have invalid format strings		HOLIDAY ENTITLEMENT	CALCULATO	CALCULATOR JH
JAMES STEWART PUSHED TO FRONTEND Move duplicated error handling code into application controller		SEARCH AUTOCOMPLET	E BACKGROUN ISSUE	CSS,SEARCH JW ROUTER,X-PROP
HEATHD PUSHED TO FRONTEND Really fix homepage redirect.	A DAY AGO	GOV.UK DEV DASHBOAR GOOGLE ANALYTICS BRI	D TEXT OVE EAKS CMD+C	EPIC-DASHBOARD JH ANALYTICS
HEATHD PUSHED TO FRONTEND Fix homepage redirect.	A DAY AGO	PAGE DOESN'T LOAD AT SOME BITS OF UI (ESP. T	ТНЕ ТОР НЕ ВОТ	FRONTEND BROWSER TESTING
JAMES STEWART PUSHED TO FRONTEND	A DAY AGO	DISPLAY OF FOCUS STAT	TE WORKIN	BROWSER TESTING
CENTRAL LINE GOOD SERVICE		PICCADILLY LINE	GOOD SERVICE	

Dashboards keep our developers and editors up to date with the latest status reports and highlight any critical problems. They are displayed on large screens close to developers' desks so that they can be easily monitored. This means that, for example, bugs can be spotted quickly and fixed.

Read <u>this blog article</u> to find out how these dashboards were developed.

Further reading

- For a more detailed discussion, you may find this section on data visualisation useful.
- <u>Designing with Data</u> is an excellent book by Brian Suda which helps you to design beautiful and powerful data visualisations.
- <u>Juice Analytics</u> is a great website with loads of useful resources on how to design and develop useful data visualisations and dashboards.
- Edward Tufte's <u>The Visual Display of Quantitative Information</u> is the archetypal work on data visualisation and introduces the concept of *chartjunk*.

7 - Monitor, iterate, and improve

Test a range of performance improvement initiatives and monitor to see which work well. These can be piloted or trialled on a subset of your users to minimise risk. Implement the best performing solutions widely and then repeat this process relentlessly: what you measure will change over the course of a product or project's lifetime.

Taking an iterative approach to service development increases the pace of improvement and minimises the risk of failure.

A range of options are available for improving the overall performance of a service. The following examples are based on the <u>4 Ps</u> of marketing:

- Price: can the price be changed, for example to attract people to the digital channel?
- **Product:** can the user experience be improved (e.g. from user feedback, user testing, A/B testing, multivariate testing)?
- Placement: can the digital service URL be placed on printed materials and voice recordings?
- **Promotion:** can greater use of email and social media be used to promote repeated use of the digital service?

Checklist

- a. Have you taken an iterative approach to developing your service?
- b. Have you done any A/B testing or multivariate testing?
- c. Have you evaluated the effectiveness of your performance reports?

Example



Further reading

- This <u>article in Wired</u> shows how A/B testing was used to good effect in, amongst other things, Obama's election campaign.
- This <u>article in eConsultancy</u> shows how multivariate testing was used to improve conversion rates at Lovefilm.

Feedback

This is an alpha release of the performance framework, and we would like your feedback. Is there anything you think we should add that would make this framework more helpful? You can email your feedback to <u>pdu-feedback@digital.cabinet-office.gov.uk</u>.