

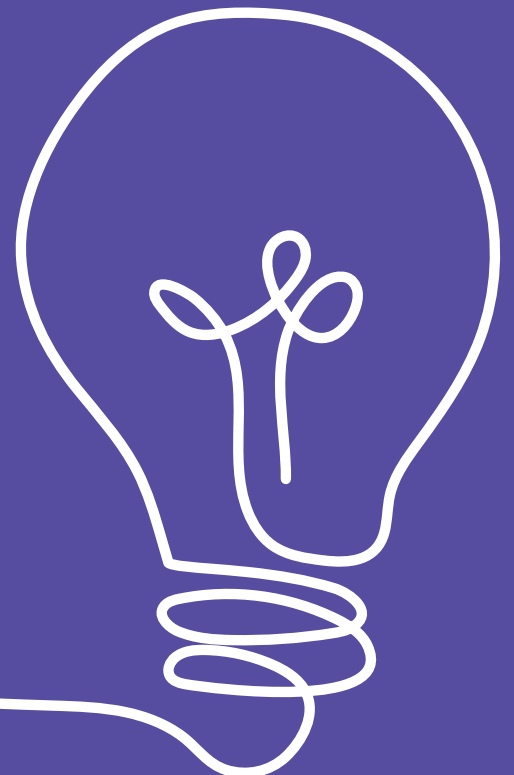
K3



USING SQL AND POWER BI TO ANALYSE DATA AT SCALE TO CREATE SPC CHARTS TO AID DECISION MAKING

NHS ENGLAND

LONDON



FOR INFORMATION ON THE
INNOVATION PROGRAMME
[CLICK HERE](#)

THE INNOVATOR

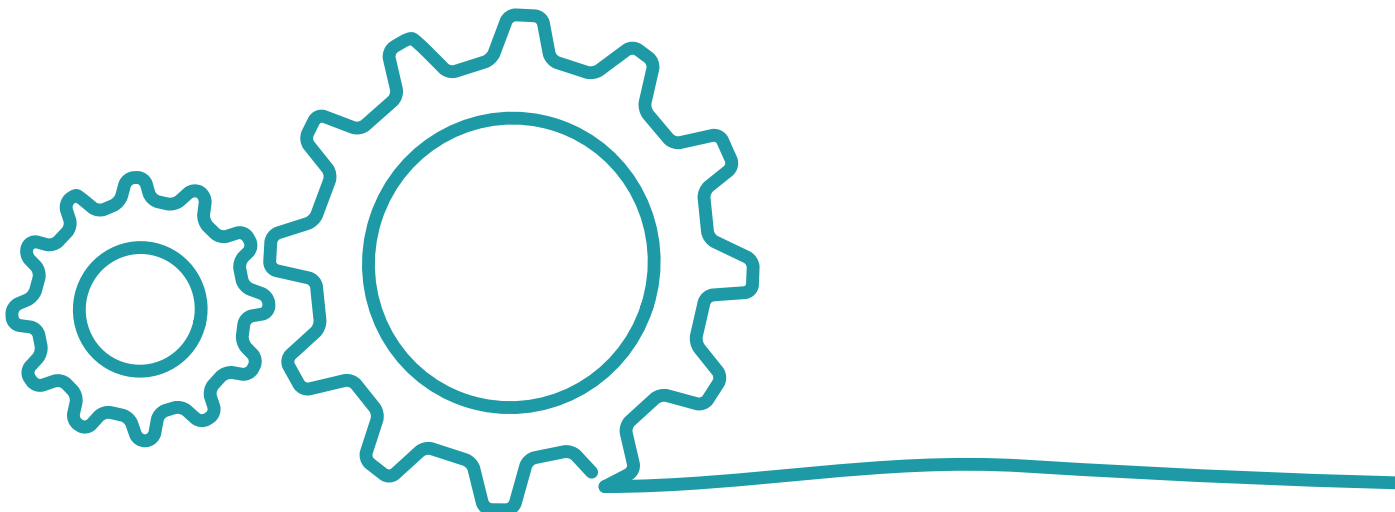
Matthew Callus is an analyst in the Making Data Count team, which works within the National Intensive Support Team at NHS England to support the most challenged organisations and systems. The Making Data Count team deliver training on the benefits of statistical process control (SPC) charts and develop tools to allow colleagues within the NHS to create their own.

THE PROBLEM

Organisations and systems need to be able to analyse large volumes of data to create statistical process control (SPC) charts, otherwise the true nature of performance and assurance in processes may be missed, with time and effort spent in the wrong areas.

THE CHALLENGES

- How might we present data so that a true understanding of the processes is understood?
- How might we present data so that the areas to focus on are known?
- How might we create tools so that analysts and developers can adapt them for local needs?



THE INNOVATION

The making data count team works within the national intensive support team at NHS England, delivering training on the benefits of statistical process control (SPC) charts and developing tools to allow colleagues within the NHS to create their own.

Over recent years, a variety of tools have been developed by the team for Excel, where data can be entered and SPC charts displayed. In addition, there was also a SQL query to execute the calculations necessary to produce SPC charts, which then requires the user to use another programme to show the chart.

There is a need by organisations to create SPC charts at scale, and many alternatives cost a significant amount of money, whereas the tools developed by the making data count team deliver this at no cost.

The SQL query was rewritten from scratch to accomplish multiple goals:

- to significantly reduce the execution time
- to present the query in a structured way with thorough instructions to make it easy to use
- to allow more ways to customise the calculations used to adapt to local needs.
- The main features added were:
- the ability to choose multiple chart types (XmR, T, or G) to present different types of data side by side

- options to change the sensitivity of detecting patterns in the data
- control to set baselines, step changes, variable targets, ghosting (i.e. excluding data), and chart annotations as necessary.

In addition to the new SQL query, tools were developed for Excel and Power BI to display the charts. The Power BI tool allows analysts and developers to quickly create a bespoke dashboard of SPC charts that uses their own data through the SQL query.

To accomplish this, the Power BI template file was built with multiple pages, offering different views of the data to suit different needs. The template connects to the output table generated by the SQL query, which does most of the calculations, so the pages are responsive to changes and interactions.

Over time, new versions of the tools have been released and demonstrated at analyst network meetings. Feedback has been taken on board to apply corrections and drive development. A how-to guide was also created to explain how to use the tools.

Ultimately, these tools allow organisations to analyse their data in SPC charts to make better decisions with relatively little time resource spent and at no cost.

THE LESSONS LEARNT

We learnt to include finance teams in our work on training the benefits of SPC by realising that they would also be interested and that they often operate quite separately to business intelligence teams, who were the focus of the training previously.

THE OUTPUTS

The innovation led to:

- the SQL query and Power BI template
- closer links between finance and business intelligence teams
- finance teams understanding the benefits of using SPC.

THE OUTCOMES

The innovation resulted in:

- an ability to quickly analyse data at scale to understand performance and variation
- finance colleagues are now aware of the training and support that they can call on from the making data count team
- an increase in the number of people wanting to join the making data count finance subgroup.

THE QUICK WINS

Some advice for others with a similar project is:

- When developing such a tool, get feedback on what is needed before spending time adding features, and decide what features can be added and develop to allow for easy expansion in future.
- Test thoroughly before releasing, ideally with a small group of test users, to minimise the chance of needing to release corrected versions once the tools have already been downloaded.
- Provide plenty of training in different formats (e.g. video and documentation) at different levels of detail to minimise time spent answering many individual queries.

THE REVIEWERS SAID

“AN EXCELLENT INNOVATION, HIGHLIGHTING HOW FINANCE TEAMS CAN USE PREVIOUSLY UNDER UTILISED SKILLS COMBINED WITH NEW TECHNOLOGY TO SPEED UP ANALYSIS AND VALUE TO THE NHS.”

“SPC ARE A USEFUL ADDITIONAL TOOL FOR ASSESSING VARIATION WITHIN AND ASSURANCE OF, A PROCESS. AS SUCH IT IS IMPORTANT THAT THEY ARE WIDELY AVAILABLE AND USED.”

“THIS INNOVATION, PACKAGED AS IT IS, IS VERY APPEALING TO USERS WHO HAVE COME ACROSS MAKING DATA COUNT AND WANT TO PROCEED WITH THEIR JOURNEY INTO SPC CHARTS.”



WHAT YOU CAN DO NOW

SUBMIT INNOVATION

If you recognise the problem stated and have implemented your own innovation to overcome it please submit this innovation to the programme and give others more examples to learn from.

REGISTER INTEREST

If you recognise the problem stated and would like to know more details about this innovation in particular, we will be hosting showcase and workshop sessions throughout the year, so all interested staff can gain ideas and inspiration from innovators in a manageable one-to-many format.

SUBMIT PROBLEM

If you have a problem but don't currently know of a solution to it, then please submit it here and in 2022 the Forum intends to crowdsource solutions to problems that don't currently have known innovations.

LEARN MORE

If you would like to learn more about about the innovation programme please click for more details.

ENDORSEMENT DISCLAIMER

The Finance Innovation Forum's Innovation Programme asks NHS Finance peer reviewers whether the "Innovation overcomes, successfully addresses, or solves the problem identified". The programme does not endorse, recommend or provide any assurance of software used or mentioned in any of the published innovations. If you think a published innovation is being used to falsely validate a commercial product or company please contact finance.innovation@nhs.net



IN SEPTEMBER 2021 THE FORUM LAUNCHED...

- A national Innovation Programme for NHS Finance staff to submit their innovations for peer review. Successful innovations will be published and accessible to all on the One NHS Finance website
- A 'Software Skills For Finance Staff' event series taught by NHS Finance for NHS Finance including MS Excel, PowerBI, SQL etc.
- An 'Art of the Possible' briefing which explains two new technologies AI & Blockchain and discusses the opportunity for NHS Finance
- An Automation Group to review and improve the efficiency of existing national processes and returns

WHAT YOU CAN DO NOW

- Submit your innovations for peer review
- Sign up to be an innovation peer reviewer
- Read Art of the Possible
- Sign up for Software Skills for Finance
- Register your interest in automation and all things innovative

Innovation Programme



Software Skills



Automation sign up



Be a peer reviewer



Art of the Possible



FURTHER INFORMATION

Website: FinanceInnovation.nhs.uk

Email: FinanceInnovation@nhs.uk

LinkedIn: [One NHS Finance](#)

Twitter: [@OneNHSFinance](#)



One NHS Finance brings together the Future-Focused Finance, National Finance Academy, and the Finance Innovation Forum programmes and networks to make sure that everyone working in NHS Finance has access to skills, knowledge, methods, and opportunities to influence and enhance patient services.



An NHS Finance platform for the discovery and development of problems, ideas and innovations.