

Kestrel Fact Sheet 1

Background and overview

Purpose of the Fact Sheet

To explain what Kestrel is, some of its key principles and features.

Background

Kestrel is a software system that has been developed by the UIC to meet the diverse needs of operators and Commissioners/Authorities in understanding, improving and reporting the reliability and performance of train, light rail, tram, bus and ferry operations.

We have a diverse range of clients, examples to illustrate Kestrel's flexibility being:

- Caledonian Sleeper, Scotland
- Rail Operations Group (specialist UK-based train operator)
- ScotRail
- Transport for London (Crossrail)
- Yarra Trams, Melbourne

There are more details of clients and the features of their versions of Kestrel in Fact Sheet 4.

Kestrel is uniquely flexible. It is a modular system incorporating an out-of-the-box set of tried-and-tested features. Each version is customised for the client by mode, timetable structure and Performance Regime. The start-up set includes Dashboards, reporting and analytical functionality based on our many years' experience in data analysis and assisting organisations to improve their operational performance.

The database can be adapted for any and multiple data sources. As well as this, data from different modes (e.g. heavy rail, bus or light rail) can be easily connected enabling analysis across and between modes to reflect the customer experience of the network rather than the stand-alone performance of individual components.

Why does Kestrel exist?

- Reliability and punctuality are the number one driver of customer satisfaction. An affordable/accessible/integrated/frequent service that is reliable and punctual drives customer satisfaction which in turn drives patronage.
- Operational Performance Regimes (and associated reporting requirements) are becoming more complex and changing more frequently
- What works and what doesn't work as far as performance improvement is concerned is well known and built in to Kestrel
- In order to improve, data is needed to point the way
- Kestrel is designed with easy-to-use functionality for both occasional and regular, general and specialist users. This means that instead of having one Performance Team, all managers across the organisation (or multiple organisations) that have an impact on operational performance are directly involved in its improvement.

What is Kestrel's pedigree?

Kestrel is of the finest pedigree. UIC colleagues have been working on operational performance systems since the late 1980s and the UIC has been providing Kestrel's predecessors since 1999. The first version of Kestrel was implemented at the Docklands Light Railway in London in 2009. Kestrel is more than software, it is the accumulation of decades of operational performance improvement knowledge and know-how.

What Andrew Haines, Chief Executive of Network Rail, said

At the risk of blowing our own trumpet (other brass instruments are available), here is an extract from the March 2020 edition of Modern Railways reporting on The Golden Whistles, an annual event held in the UK 'to promote best practice and celebrate excellence in railway operation':

A Silver Whistle was presented to Network Rail and ScotRail teams from north of the border who worked on a new methodology to highlight specific trains causing most issues in 2018. Working with supplier Kestrel, innovative analysis was undertaken to show which trains were the trigger trains and caused a ripple effect across the network. This prompted 30 small interventions which have led to the highlighted trains seeing their knock-on delay reduced by one-third and their Public Measure improve by 14%. Network Rail Chief Executive Andrew Haines called the paper 'the best argued paper I have seen since returning to the rail industry'.

Some high-level lessons about the importance of analysis can be drawn from this example:

- Kestrel isn't a magic bullet - effort needs to be put into analysis
- The analyses carried out in this example are standard features in Kestrel's Analytical Tools
- Improving performance often doesn't require major investment, just a bit of effort to carry out the analysis, which will then point the way to specific, often small, interventions
- The UIC is always happy to help our clients with complex analyses

System objectives

The primary purpose of Kestrel is to provide organisation-wide information in order to understand and improve operational performance by:

- Maximising the efficiency of the collection, display and analysis of the performance reporting process including speed and accuracy
- Making this data available to the entire organisation as appropriate and specifically those directly involved in performance reporting and improvement
- Providing senior managers with concise strategic information so that improvements can be prioritised, investment decisions validated and resources concentrated where they are most needed
- Automating the production of data required for reporting purposes (both internal and external) and therefore reducing the reporting workload
- Reducing dependency on the Performance Team for the production of performance data
- Statistically validating that improvement is being made

The scope of the system can be widened to include (for example) capacity management, customer satisfaction and action tracking.



System principles

- All performance data and reports in one place - the one source of the truth
- The overall purpose is to provide insight that allows improvement in operational performance
- All routine tasks, in particular performance reporting, automated
- Easy to use for both regular and occasional users, in particular Kestrel is designed not only with data and performance specialists in mind but also busy front-line managers with limited time and basic systems and/or data analysis skills
- Easy to use analytical functions
- Easy access by multiple users potentially from a number of different organisations for a variety of purposes
- Can be used in the office, at home or out-and-about
- Data 'pushed down' to the level of Responsible Manager
- As close to real-time as possible
- High-level strategic data sits alongside the ability to drill down into the detail
- Statistically robust with graphs that are easy to interpret and analyse
- Easy to implement
- Minimum training requirements

System functionality

- Ability to analyse punctuality (e.g. delays), reliability (e.g. cancellations and part-cancellations) and incidents (e.g. operational incident, points failure) data by:
 - Location
 - Cause/root cause
 - Responsible Manager
 - Route
 - Service group, geographic area, depot
 - Individual service
 - Diagram/block
 - Time of day, day of the week
- Quick and easy Pareto Analysis, e.g. top 10 worst performing services
- Ability to analyse time gained/lost en-route
- Ability to analyse frequency of service, headways and dwell times
- Attribution of delays and incidents:
 - To incidents
 - To root cause
 - To Responsible Manager
- Knock-on Delay Analysis
- Automatic report production:
 - Daily, weekly, monthly, annually
 - Ability to add commentary
 - Ability to customise for mode/organisation/mandatory reporting as required
- Linkage to improvement plans
- Statistical Process Control Module available

Standard modules

- Dashboards
- Reports
- Enquiries
- Analytical Tools
- Attribution

These are described in Kestrel Fact Sheet 2.

Additional functionality

- Capacity management (formation against plan, passenger counts)
- Contract management including financial calculations
- Logging including the ability to link incidents
- Incident management
- Action tracker
- Mobile inputs (from smart phones and tablet devices)
- Customer feedback capture
- Statistical Process Control - easy and automatic addition of Control Limits to time-related data

System development

Kestrel is not a static system. Instead it develops as user experience grows and requirements change. Our approach to system development and licence structure ensures rapid implementation of Version 1 with all essential functionality. After that we work closely with users to introduce small scale enhancements on an ongoing basis with major releases adding additional functionality and modules as required.

Using Kestrel to improve performance

- Kestrel has statistically sound but easy to understand data display, e.g. Run Charts, Histograms, Pareto Charts
- It is easy to see (for example) worst performing services
- There is straightforward identification of areas requiring attention
- Kestrel encourages Responsible Managers to deal with the delays caused by their areas
- We can provide advice on and training in how to go about improvement

The end game: What does successful implementation/adoption of Kestrel look like?

- (1) Organisation-wide use, not just a few performance people
How do we know?
Monitoring and reporting of user activity (managerial roles, especially on the front-line) and what functionality they are using.
- (2) Better understanding of the issues that contribute to poor performance
How do we know?
Implementation of a sophisticated codification of attribution, and then measurement of the proportion of delays and incidents that are correctly allocated to root cause on first attempt.



- (3) A variety of analyses are being carried out, in particular good graphs are being used
How do we know?
Reporting and compliance are of reducing importance, understanding and insight are of increasing importance.
- (4) The organisation has a prioritised list of projects to improve operational performance at a variety of levels
How do we know?
We can ask to see the list.
- (5) The list of projects has been identified and prioritised using high-level data analysis and each project has a measureable improvement objective
How do we know?
We can ask to see the data.
- (6) Improved reliability and punctuality at service, route and network levels
How do we know?
Statistical validation instead of reporting a 0.01% different as an improvement.
- (7) Reduction in the number of incidents
How do we know?
We count the number of incidents, the number of affected services and total delay minutes (including knock-on) attributed to each incident.
- (8) Customer satisfaction improves
How do we know?
Customer Survey Results always improve shortly after operational performance improves.
- (9) Elimination of ad-hoc performance reports in other formats - Excel, Access, Tableau, Business Objects, QlikView, etc. - and adoption of one single source of the truth
How do we know?
All operational performance data comes from Kestrel. Rogue, home made reports and spreadsheets, reliant on the knowledge of a few individuals are no more.
- (10) Diversification away from 'just' operational performance
How do we know?
Integration of operational performance data with different datasets such as defects, service quality inspections, safety, patronage, energy efficiency etc.
- (11) The operational performance data produced by Kestrel is common currency throughout the organisation
How do we know?
Looking and listening for the following:
- Kestrel data being used to drive the structure and agenda of daily performance meetings
 - Reduction in the blame game between departments and a collaborative approach taken to improvement
 - Meaningful high-level discussion about operational performance at Executive Team level and not just rubber stamping of reports with arbitrary target setting