

## Case Study: The Newcastle City Council Speed Management Network

### The Application-focused organisation

Traditionally organisations have seen themselves as being application-focused. The organisation took in data from a variety of sources – sensors, manual data collection, buying in external data etc, and used that data to help provide services (and or products) to its customers, or staff. Raw data was obtained from its sources by applications (either built in-house or purchased) and applications delivered information. In general the applications receiving the data and those outputting the information would be different requiring some form of data transfer between them.

Many of the applications would be commissioned by individual departments (or teams) within the organisation. These commissions would therefore be focused on the delivery of some specific service and would typically treat any internal data management and transfer as technical detail of secondary importance. As a consequence data would be trapped within vertical application silos and unavailable for widespread utilisation across the organisation, as illustrated below. In addition bespoke development created non-standard data transfers between applications locking the organisation into long-term dependency upon the application vendors.

This siloing effect also resulted in replication of effort as the same data might be collected by multiple applications and similar information delivered to multiple users.

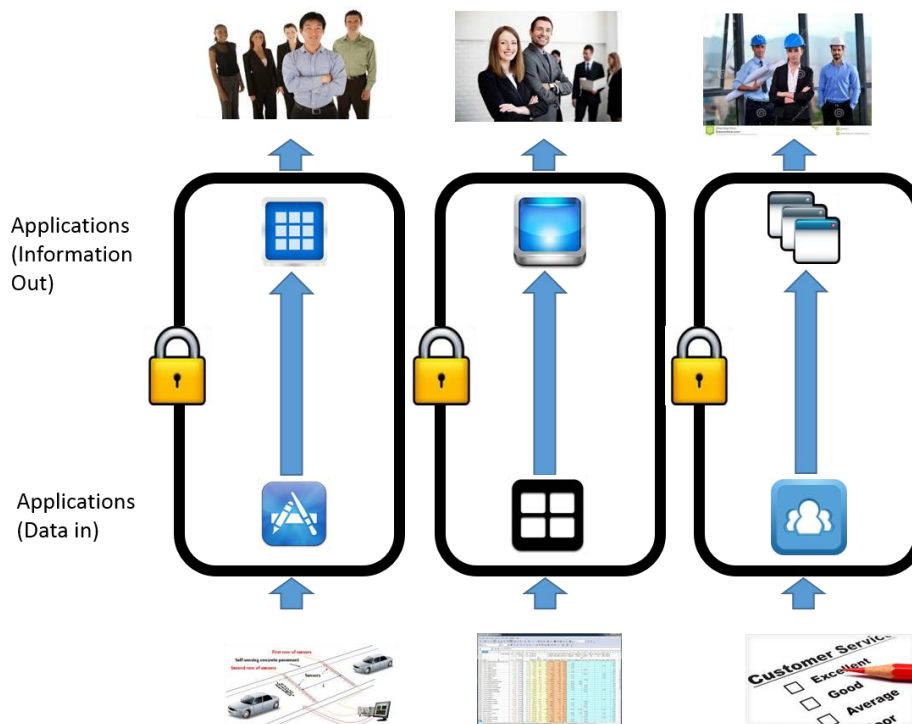


Figure 1: Application silos

### The Data-focused organisation

Increasingly, organisations are beginning to realise that the data they collect and curate is one of their most valuable assets. (Major companies such as Google, Amazon, Facebook, Apple and others realised this some time ago and give away free services in an effort to collect and become the managers of as much consumer and business data as possible). Organisations who maintain effective control of their

data are able to find new innovative ways to exploit their data equity and at the same time to free themselves from vendor lock-in.

Ensuring that data collected by applications is maintained with the organisation and that applications delivering information to customers and/or staff obtain their data from the organisation (rather than directly from another application) breaks down application silos increasing the potential exploitation of data and making it easier for the organisation to replace applications if required.

This is illustrated below. Data collected is held within a horizontal Data Management Layer and then made available to applications as required. The availability of a broad range of data enables new and exciting applications to be developed which can extract value from disparate, even seemingly unrelated, data sets. The decoupling of applications makes the entire system easier to understand and enables one application to be more easily replaced by another.



Figure 2: Freeing up data

The case study which follows describes an example in which a Data Management Layer has been introduced to Newcastle City Council. The example illustrates that adding a Data Management Layer need not be a disruptive process. It can be achieved incrementally and can produce immediate benefits which encourage further progress.

## The Newcastle City Council Speed Management Network

Newcastle City Council, in common with many other Local Authorities, collects traffic information from many different sources. In the case of Newcastle much of this information is delivered to the Urban Traffic Management Centre (UTMC) which collates and interprets the information in order to better manage traffic flow through the city. In addition a Traffic Team collects data for analysis in order to reach decisions as to long-term planning for the city's traffic. Data is collected for both purposes from a variety of sensors and cameras, and also from manual observation, surveys etc.

Some years ago a Speed Management Network was introduced by the City Council. Speed-loops were embedded in a number of roads at considerable cost. The loops were capable of detecting vehicles as they crossed and of ascertaining the type of vehicle and its speed. Two software applications were commissioned, the first to collect the data and deliver it to a second which was responsible for generating reports to be delivered to the Traffic team. Unfortunately the vendor delivering the first application went out of business and the vendor of the second application withdrew its support after a dispute. This situation is illustrated below. Consequently although most of the physical sensors continued to operate correctly and the first application continued to collect the data, the second application ceased to function so no output could be obtained by the traffic team.

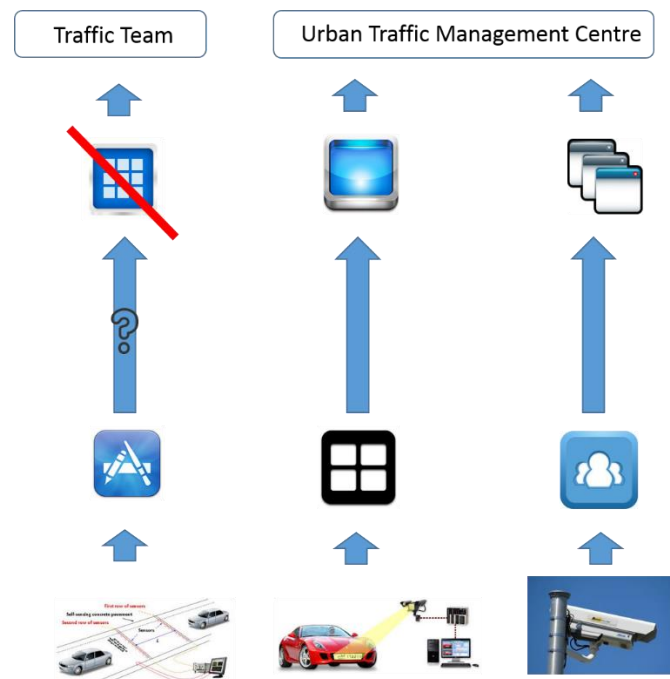


Figure 3: At the start of the project

This is indicative of the problems created by application silos. The data transfer between the two applications was entirely bespoke, there was no documentation and no support, so commissioning a new application to replace the one which had ceased to function would have been costly and time-consuming.

Newcastle Council turned to Arjuna technologies for help.

## The Agility DataBroker

Arjuna have created the Agility DataBroker product to act as a Data Management layer in just such a scenario. The project team worked to understand the data format being created by the application responsible for collecting the data from the sensors and created a plug-in for the Agility DataBroker

which was capable of obtaining the data. They then created a Agility DataBroker plug-in capable of outputting the data in the reporting format previously provided by the now defunct application. This was delivered to the Traffic Team restoring the lost capability. However, the fact that the data format was now actively managed, coupled with the flexible plug-in capability of the Agility DataBroker provided other opportunities. A new plug-in capable of delivering the data as a real-time stream was added in order to deliver the data to the software vendor currently supporting the UTMC. That vendor was then able to deliver the speed management information directly to the consoles of the UTMC. Another plug-in delivered the data to a website where the information could be viewed by the public and a fourth plug-in delivered the data in the form of monthly reports for the consumption of the region's Traffic and Accident Data Unit (TADU).

The eventual architecture is illustrated below.

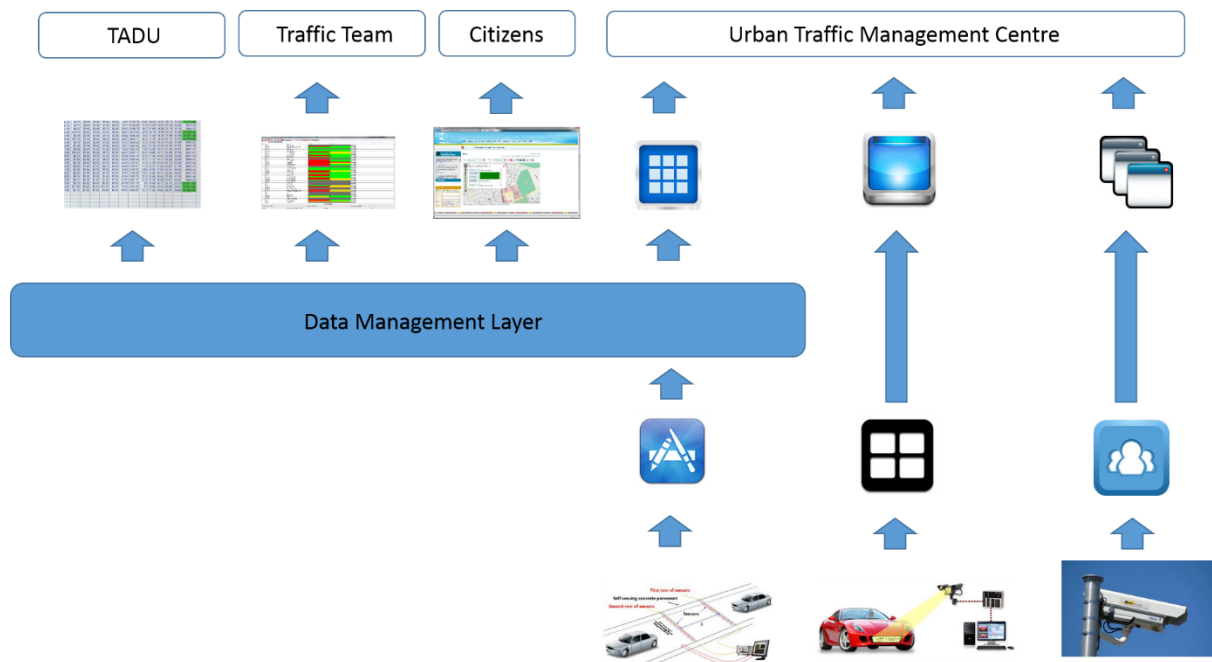


Figure 4: At the end of the project

The project illustrates the problems with allowing data to be consigned to application silos and the advantages of introducing a Data Management Layer. In this case the introduction of the Agility DataBroker enabled the original functionality to be recovered, and the ability to deliver the data in multiple outputs opened up new opportunities to share the data within the organisation and beyond. Sharing the data and combining it with other data allowed new information to be obtained with the potential to improve decision making thereby reducing costs and/or improving service.

The Agility DataBroker was introduced without impacting upon other applications and it should be clear that a step by step expansion in order to consume additional data would continue to provide additional benefits. In fact with data the sum of the total exceeds the sum of the parts as adding more data sets increases exponentially the number of ways in which data can be combined. In addition the Agility DataBroker is capable of delivering data in whatever format is required and with whatever transformation is required. This opens up the opportunity to deliver data to both internal and external application developers in order to encourage innovation, and to citizens and improve access to Council information.