

## Case Study: Directory Services

### 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.

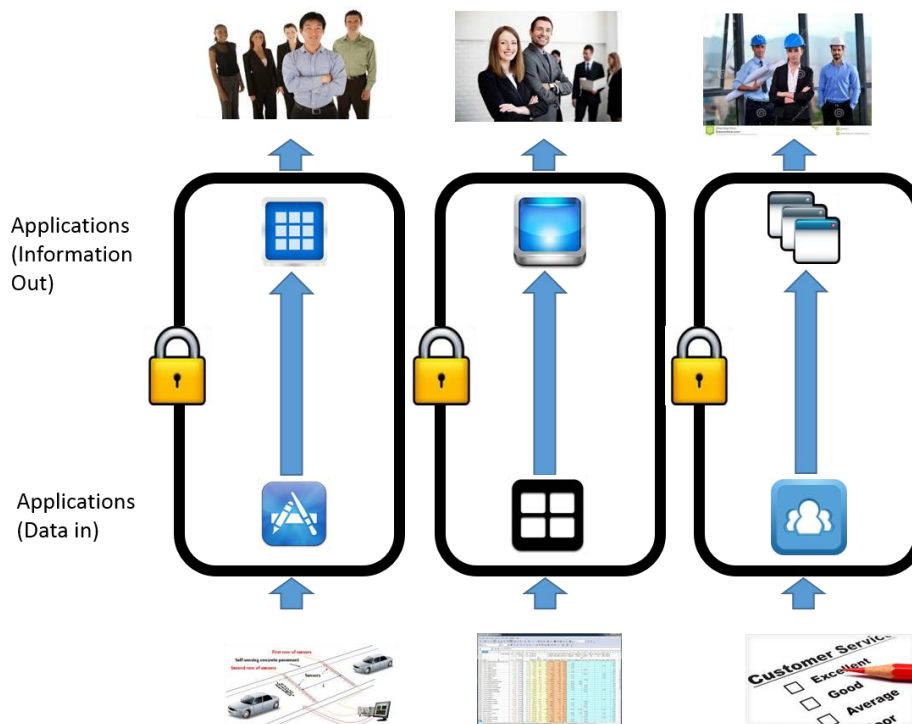


Figure 1: Application silos

### 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 Directory Services

Newcastle City Council, in common with many other Local Authorities, collects information about council, commercial and voluntary service offerings from many different sources. In the case of Newcastle, and most Local Authorities, this information is delivered to citizens via a broad variety of websites, each catering to particular demographic. In the main each of the website providers works largely in isolation in order to collect data, maintain that data and publish that data. As a consequence there are numerous application silos. In many cases there is considerable overlap in the demographic being served e.g. in Newcastle separate websites cater for Families, the Over 50s and for 'harder to reach groups'. Clearly there are members of a society who belong to more than one, or even all, of these groups. Consequently the same data is collected multiple times, stored in multiple systems and delivered to citizens in different format. Not only is this wasteful of effort but it is also confusing for citizens and leads to inconsistencies. Additionally the data trapped in its silo is not available for exploitation for other purposes.

The individuals responsible for the three websites previously mentioned ('Families Information' – providing information for families, 'Information Now' – providing information for the Over 50s, and 'InvolveNE' – providing information for 'harder to reach groups') recognised the inefficiencies in the current approach and turned to Arjuna Technologies for help. The initial situation is illustrated below. Data for all three websites (and many more not considered here) is collected independently by each team through phone, email and paper surveys, is independently maintained and independently published on different websites. The data is not available except as published on the website.

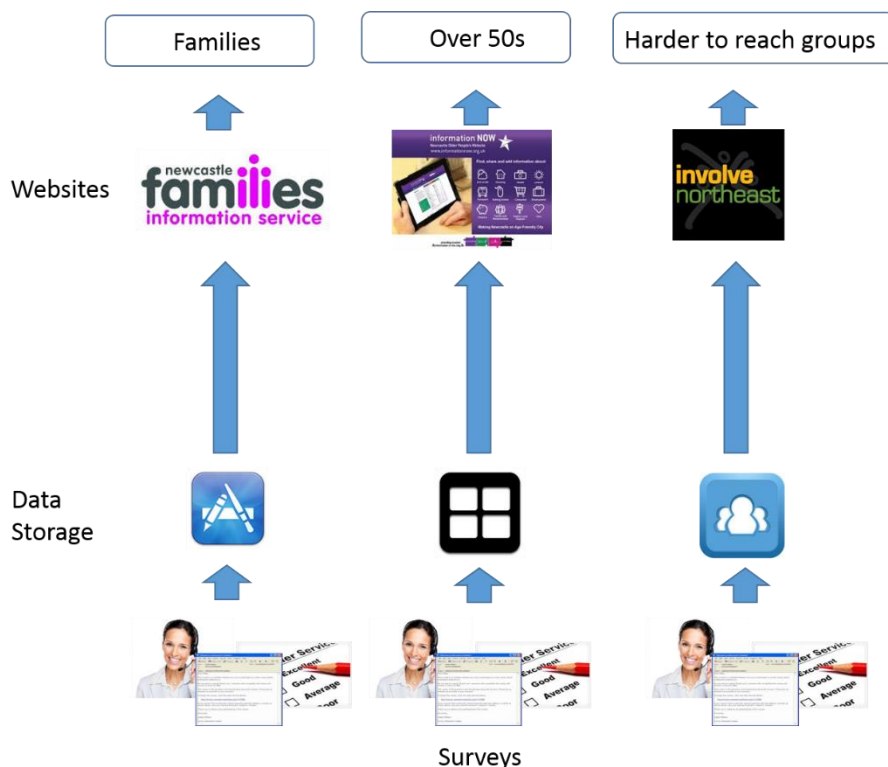


Figure 3: At the start off the project

## The Agility DataBroker

Arjuna Technologies have created their Agility DataBroker product to act as a Data Management layer in just such a scenario. The project team wanted to proceed carefully with minimum disruption to the various teams so as a first step introduced the Agility DataBroker as a means of holding copies of the

data collected by each independent system. To do so they created a plug-in for the Agility DataBroker which was capable of obtaining the data from the existing Data Storage systems. They then created Agility DataBroker plug-ins capable of outputting the data in formats readily accessible to application developers. An interim architecture after the introduction of the Agility DataBroker is illustrated below.

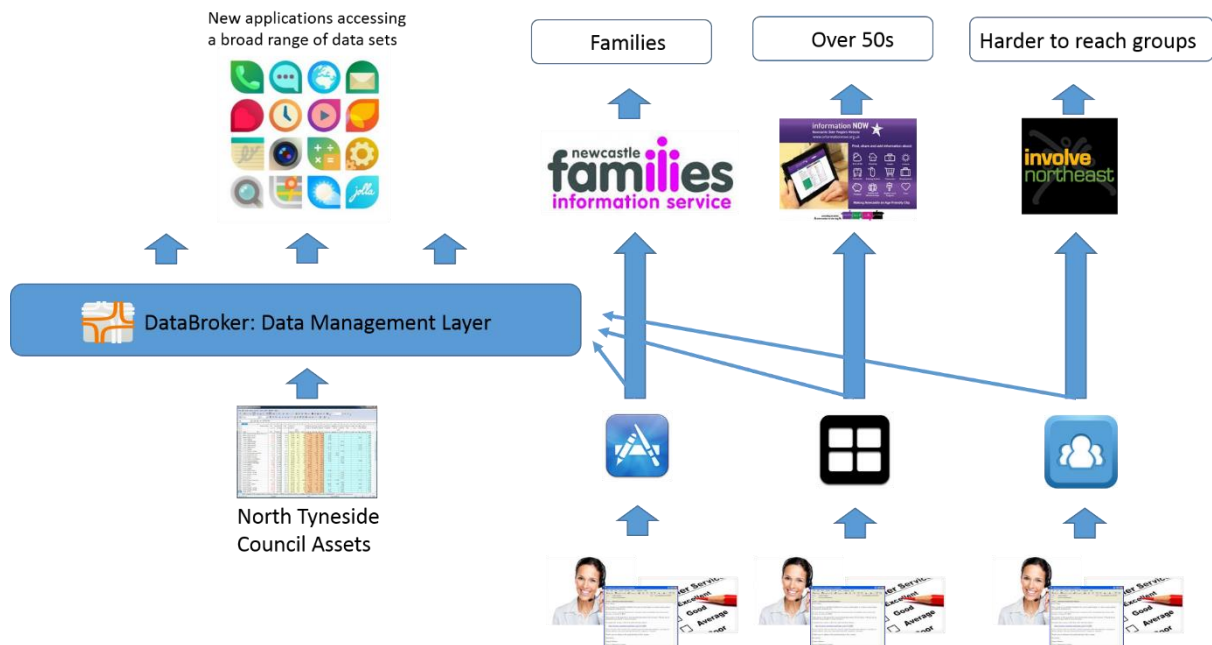


Figure 4: The interim solution

Providing application developers with access to these data sets opens up the potential to deliver many new innovative applications which can benefit citizens. This opportunity becomes all the more powerful when additional data sets are added. Within this project a number of additional data sets were exposed through the Agility DataBroker including a large data set provide by North Tyneside Council, a neighbour of Newcastle City. This potential has begun to be explored in an ongoing series of hackathons run by the Cloud Innovation Centre and sponsored by ENGIE.

The introduction of the Agility DataBroker and the publication of the various data sets was a relatively simple process which required minimal effort and no disruption of the existing systems. However, whilst this first step opened up previously closed data sets it did nothing to address the fundamental inefficiencies caused by the existence of multiple application silos. Addressing these issues requires a further series of incremental steps by which the Agility DataBroker would be extended so as to deliver the data collected directly to each of the Websites. Once this has been achieved the means of collecting and storing the data can be rationalised so that duplication and inconsistencies can be removed. The eventual, intended architecture is illustrated below.

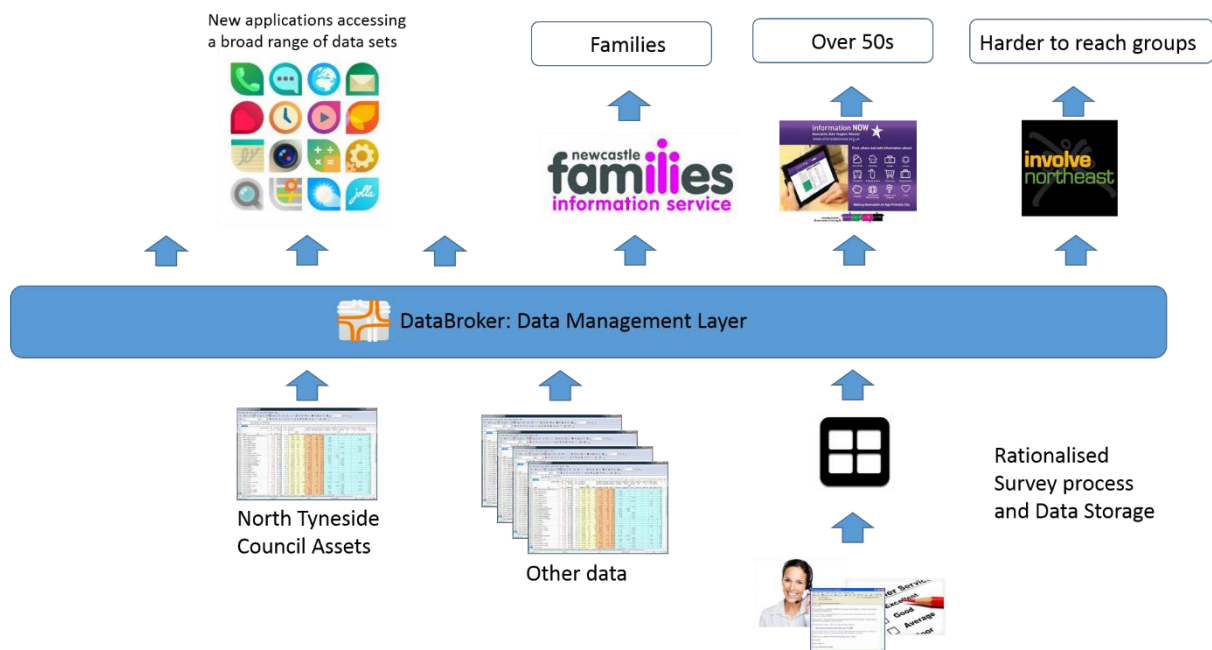


Figure 5: The eventual outcome

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 enables the inefficiencies in data collection and storage to be removed, 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 allows 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.