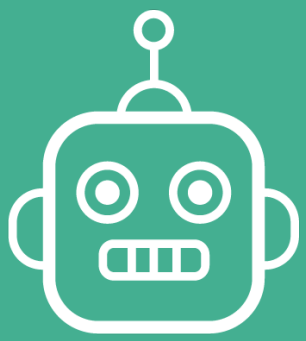
4 ROADS

ROBOTS TO THE RESCUE:

8 WAYS INTELLIGENT SELF-SERVICE CAN SAVE LOCAL SERVICES



How intelligent self-service can help deliver service transformation, channel shoft, revenue opportunities and efficiencies.

A 4 Roads discussion paper for local athorities, government agencies, charities, advice services, or other third sector operators.

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FOREWORD BY CLLR MIKE ROUSE

The ability for software to transform the civic sector is an itch I have been trying to scratch since around 2003 when I was first involved as an early adopter of a new political platform that acted as a CRM, website, and volunteer management system all rolled into one for US political candidates. The software transformed a campaign for one candidate in particular, allowing them to raise record amounts in small donations and energise the US public into a ground-breaking change. That candidate was Barack Obama, and his software was an early example of how intelligent self-service can transform service delivery, encourage channel shift, and deliver financial results.

These tools certainly help to win elections as I found myself when I clinched victory by a single vote following a campaign that relied heavily on digital tools. As a newly minted digital-savvy Borough Councillor, I have produced what I believe is the first chatbot to assist my constituents with issues around fly-tipping, rubbish collection and more. Yet none of these services connect to the local council's systems in any way. I must log things manually with someone, who in turn logs it manually on a system, which in turn produces a printed job sheet for the local team. Intelligent self-service can, and will, transform these processes.

This is where companies like 4 Roads and this discussion paper steps in. As experts in artificial intelligence, automation and intelligent self-service, 4 Roads are well placed as your next digital agency to deliver projects to enable your organisation to deliver enabling services to your residents, improve the speed and quality of advice, and improve your internal efficiency.

As I look back at the early roots of civic software and how it has brought citizens and institutions closer together, I also look to the future with a mix of both optimism and concern. Whilst the opportunities are huge, we also have to be mindful that software today needs to be delivered with a social conscience against an ever-changing legislative backdrop from GDPRs to 'duty of care' responsibilities. I believe Intelligent Self-Service (ISS) is the only answer that balances this effectively, and I hope this discussion paper helps you understand more about its capability and fit within your organisation.

Once you've read the paper, I'd be delighted to hear your thoughts and views on the topic. Join me, along with colleagues who are also interested in this area, for discussion on our LinkedIn Group at http://bit.ly/isspubsec, or you can email me directly on mike.rouse@4-roads.com

SCAN ME

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Intended audiences and aim

The aim of this discussion paper is to inspire people who work in the UK's public bodies to open discussions internally and across partners about how they can deploy an Intelligent Self Service (ISS) Strategy that sits across the entire organisation, with top-level sponsorship and support.

The strategy should drive outcomes:

1. **Transform** service delivery by helping customers to help themselves in smarter, more accessible, and more efficient ways.
2. Encourage real and measurable **channel shift**.
3. **Reduce** the cost of operating processes.
4. Open new **revenue** opportunities.

The public sector in the UK is a large and complex set of organisations with differing legal structures. At the macro level there are entities like the National Health Service (NHS) and agencies of the UK Government such as the Skills Funding Agency or Food Standards Agency. Regional-level organisations exist such as the West Midlands Combined Authority or Northern Powerhouse. At the local level there is an array of local authorities, charities, local agencies, community groups, volunteer-led organisation, and religious groups – and many more nuanced configurations.

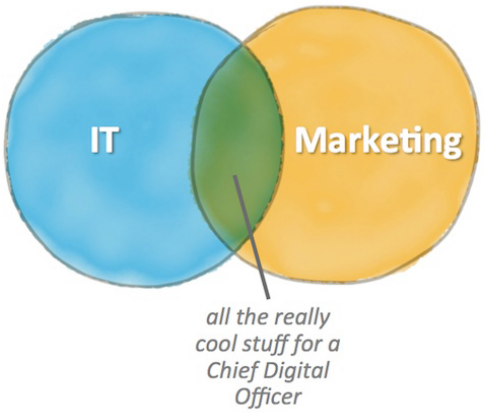
This document is intended as a discussion paper to assist heads of service, chief executives and others involved at all levels in all of these organisations (and more), including political leadership or governing bodies where applicable.

Driving the Intelligent Self-Service Strategy: The Case for a Chief Digital Officer

One of the rudimentary challenges for public sector bodies is understanding the range of responsibilities, powers and ways of describing the most senior digital, data and technology leader in the organisation or jurisdictional area – the 'Chief Digital Officer' or CDO.

Some organisations are yet to appoint a CDO – despite it not being necessary to create a new role in the organisation structure. In some organisations the decision is made to assign the CDO status to the Head of IT for instance.

CDOs are required to strike a delicate balance between 'keeping the lights on' within their departments and service delivery areas, whilst also looking to the future and shaping the vision for how their organisation will serve its customers and stakeholders through the delivery of an Intelligent Self Service strategy.



It is estimated that back in 2008 there were probably no more than about a dozen CDOs worldwide. By 2010, that number had quadrupled, which still only took it to around 50 executives globally. Fast forward to 2015, and the number of CDOs was already well over 2,000. And since 2015, the digital wave has continued its exponential rise. In 2017, a study by Strategy& (PWC), found that approximately 19% of top global companies now have a CDO, 60% of whom were hired since 2015.

Source: The Leadership Network

The discussions around the 'bigger picture' in public sector organisations often doesn't take place until organisational technology is working smoothly, and the stakeholders feel that value has been demonstrated on previous investments. It's also often necessary for the CDO to demonstrate success in the area of data-driven user-centric service design – to prove the art of the possible.

In many public sector organisations, it is also helpful when board members or elected members can provide political/executive sponsorship and leadership in the various areas of digital.

Examples of Chief Digital Officer roles and examples of public bodies implementing a CDO role can be found in our LinkedIn Group at http://bit.ly/isspubsec

THE ECONOMIC CASE FOR AI

As digital leaders inside public sector bodies weigh-up intelligent self-service, AI and automation as possible investments they naturally weigh against the ongoing commitment in their roles to 'keep the lights on' for their various service areas. They need to know if intelligent self-service, AI and automation is here to stay or is it just the 'next big thing'?

> **Intelligent self-service helps your citizens, clients and your employees achieve their goals faster and with less effort.**

$15.7TR

AI contribution to economy by 2030

To help us examine the 'size of the prize' we can turn to a study published by PWC that examines the scale of AI opportunities, which they estimate will produce a $15.7tr contribution to the global economy by 2030 with up to a 26% boost in GDP for local economies from AI also by 2030.

The study sees major contributions to this GDP growth coming from labour productivity improvements as firms seek to augment the productivity of their labour force with AI technologies and to automate some tasks and roles. In addition to this, product enhancements will drive growth as AI will drive greater product variety, personalisation, attractiveness and affordability.

To demonstrate the commitment by the UK Government to an AI-driven future we can turn to news that in September 2018 the Ministry of Housing, Communities & Local Government announced that councils could apply for grants of up to £100,000 for digital projects which demonstrate they benefit local public services and have the potential to be rolled out more widely across the country.

These could include apps to report fly-tipping, a web solution for collecting council taxes, or other endeavours to deliver changes in the way councils ensure the best quality digital services for their public.

The total investment at £7.5m underlines the government's commitment to boosting civic technology and enabling the sector to grapple with the contemporary landscape, which demands more for less.

We are at the dawn of the AI era.

Build-in appropriate governance and control

Trust and transparency are critical. In relation to autonomous vehicles, for example, AI requires people to trust their lives to a machine – that's a huge leap of faith for both passengers and public policymakers.
Anything that goes wrong, be it a malfunction or a crash, is headline news. And this reputational risk applies to all forms of AI, not just autonomous vehicles.
Customer engagement robots have been known to acquire biases through training or even manipulation, for example.

Source: PwC AI Study - Impact

EUROPE'S ANSWER: "SKILLS TRANSITIONS, INVESTMENTS AND DIGITAL SINGLE MARKET"

The UK programme follows the EU's publication of a strategy on AI published in April 2018 by the European Commission. The strategy is a three-pronged approach to:

1. Increase public and private investment in AI
2. Prepare for socio-economic changes
3. Ensure an appropriate ethical and legal framework

The strategy is part of the EU's push towards a Digital Single Market, with its vice-president Andrus Ansip saying:

> **"Just as the steam engine and electricity did in the past, AI is transforming our world. It presents new challenges that Europe should meet together in order for AI to succeed and work for everyone. We need to invest at least €20 billion by the end of 2020."**

As part of mobilisation the European Fund for Strategic Investments is beginning to provide companies and start-ups with additional support to invest in AI – with the aim of making more than €500m investments by 2020.

The EU is also considering the concerns about loss of jobs as a result of increased AI investment by encouraging Member States to modernise their education and training systems to support labour market transitions, using the European Social Fund to support digital skills and competencies.

Following the April 2018 strategy publication, the EU announced at the end of 2018 a plan to foster the development and use of artificial intelligence across Europe further. This indicates, regardless of Brexit, the EU's determination to boost artificial intelligence 'made in Europe' and push ahead with Member State development in this area.

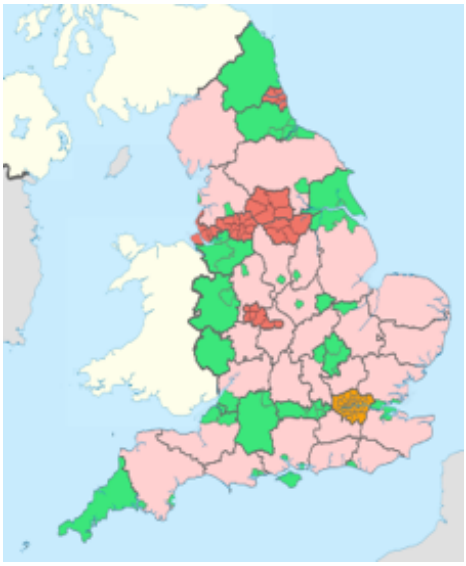
> **"The Commission proposes to develop common 'European libraries' of algorithms that would be accessible to all, to help the public and private sectors to identify and acquire whichever solution would work best for their needs."**

The challenge for UK-based civic sector organisations will be to understand how to effectively work with a post-Brexit government to ensure similar levels of investment seen at the EU-level are also provided to the UK-level at appropriate scale.

The United Kingdom is a signatory to the 10 April 2018 Declaration of Cooperation on Artificial Intelligence, and in the UK Government's White Paper publication outlining its plans for the UK's future relationship with the EU there is commitment to cooperation on digital technology, and specific mention of AI, through the UK's Centre for Data Ethics and Innovation.

UK's answer: "devolve, invest, transform"

As described earlier in this paper, the UK Government has announced a £7.5m fund for local councils to help them transform how they deliver services for their customers. This provides opportunities for others in the civic sector who provide complimentary services to work with local authorities on co-designed services and partnerships, which the funding can contribute towards.



The fund is backed by a requirement for local councils to sign-up to the Local Digital Declaration, which is something that non-councils are also encouraged to sign too.

The declaration affirms collective ambition for local public services in the digital age to best meet the needs of citizens – this is an ambition that can be shared by all civic sector organisations not just local authorities. The point of the Local Digital Declaration is to encourage working across the sector and move away from silo working.

Staff of local authorities that have signed the Local Digital Declaration are eligible to apply for free digital skills training as part of the Local Digital Fund.

At the time of writing, there have been 3 rounds of funding to local levels via the Local Digital Fund, supporting 23 collaborative projects across 100 councils.

The London Borough of Lambeth has been awarded £98,500 to conduct an Alpha Phase on developing a user-centred system that reduces the number of invalid or incomplete digital planning applications. They will partner with Wycombe District Council and London Boroughs of Camden, Lewisham and Southward to develop the solution further.

The 8 solutions for 2020... and beyond!

Deloitte has estimated that automation could save the US Government's employees between 96.7m and 1.2bn hours per year, resulting in potential savings between $3.3bn and $41.1bn per year. Rather than reducing the number of employees, the challenge is about investing in quality of services, re-employing officer time towards more rewarding and value-added work that requires lateral thinking, empathy and creativity – all things at which humans continue to vastly outperform even the most advanced AI programmes.

Instead of a social worker or a GP being rushed, they will be able to spend more quality time with their clients. In the case of mental health, this is particularly important as GPs often complain about not being able to spend more than 10 minutes assessing cases such as depression and anxiety.

Whilst there is huge potential for AI and machine learning to help solve many problems across the UK Civic Sector it is often difficult for service leaders to understand where to start and what to address first. The order can matter too – solutions in this space are built upon the solutions the precede them. Getting the order wrong can lead to costly redevelopment later.

This is especially challenging when set against a context of the need to reduce spending quickly and underneath pressure from stakeholders such as board members or elected members who will be pushing to unlock AI potential as quickly as possible.

Equally, as is the case with most technological matters, as soon as the civic body has innovated the technological landscape advances yet another step. Civic leaders will also be mindful that systems tend to be built on top of each other with little interplay between them.

In dealing with these challenges and looking to unlock AI in the most effective manner part of the answer can be found in working together with other like-minded civic organisations, such as other branches or nearby local authorities. Technology does not care for administrative boundaries.

Here are five ways technology could help reshape the UK civic sector in 2019:

1) Automation

Automation is a wide-ranging term essentially covering the carrying out of a task using programmed commands rather than having the task completed by humans – or with as little human intervention as possible. Broadly speaking there are two types of work that automation can assist with. Firstly, there is 'hand work' where the automation replaces the physical input from a human who would be using their hands and eyes to complete the task.

Secondly, there is 'head work' where a higher degree of cognitive functioning is required to make decisions against more complicated rules. An example of this might include the role of a principal planning officer who must navigate the complicated rules around planning, but also be able to understand where judgement is required to form the advice dispensed.

Robotic Process Automation (RPA) is one area that some local authorities are looking towards for some early quick wins in the AI space as new opportunities arise from new and more affordable technologies that can conduct a range of tasks.

One example of RPA is where hand-filled forms are returned by citizens, but then entered into a computer system by an operator. Though civic bodies have tried for years to encourage citizens to 'channel shift' into digital channels, effectively entering the data themselves, this is not fully realised and is unlikely to ever achieve 100% compliance. By finding an RPA solution the time spent on entering form data can be vastly reduced.

The benefits of automation for a civic sector body include:

- **Improved governance and control** – automated tasks are carried out consistently and in accordance with fixed rules, leaving little room for error or interpretation.

- **Improved customer experience** – for example simple customer transactions can be performed outside of normal office hours to suit the needs of the citizen.

- **Increased productivity** – in addition to speed of processing the automation process can define and execute a range of follow-on actions, such as sending an email update to customers that previously required a human to take time from their duties to send.

- **Upskilling of the workforce** – automation does not replace humans; it frees them up to concentrate on more valuable activities, which could well include spending more face-to-face time with stakeholders and customers.

2) One Citizen

Nearly all civic sector organisations implement systems on top of each other. For local authorities this is as a result of constantly needing to implement change over a very long period and whenever technology and requirements evolve. For some other types of civic bodies systems have grown as their organisation has grown. Rarely is there any opportunity to take a step back and rearchitect the organisation's technology.

The result is often a pile of systems that don't talk to each other about the direct records they share, let alone the 'softer' data that might be helpful when painting a broad picture: with civic organisations capturing data from a range of sources it is often a challenge to effectively turn the noise into effective and actionable data.

A single view of the citizen gives a civic organisation the ability to offer a more proactive approach. In simple terms this could be resolving the constant problem of deceased notifications not reaching all parts of the organisation resulting in distress to surviving relatives. In more complex scenarios this could result in potential revenue streams as more actionable intelligence is collated.

3) SMARTER DATA

Making sense of data remains a challenge, which is where visualisation can be helpful. Tools like augmented reality (AR) and virtual reality (VR) give civic sector bodies an opportunity to develop smarter solutions. No longer is it necessary for a cash-strapped civic body to invest in complex machinery in order to delve into the world of AR and VR – it can be achieved with a mid-market smartphone and some equipment from Google that retails under £10 per unit.

At the macro level the opportunities to join the NHS and adult social care are the most tantalising. Being able to quickly identify where a bed has become available and free-up a critical care bed will transform patient flow and deliver better health outcomes for citizens.

At the more local level, the same tools can be used to unlock revenues and cut costs for civic bodies from advice organisations to local councils.

In the local government context, the ability to provide planning committee members with a virtual reality-based site visit will allow them to avoid costs of physical visits and speed up the decision-making process.

It could even be possible to deliver an augmented reality experience to planning members, so they can place a virtual replica of a proposed building in front of them and visualise the proposal more clearly.

Overlays of distances will help members understand if a proposal involves overbearing for instance.

4) Internet of Things (IoT)

Local authorities in partnership with other civic bodies, usually care-based agencies, are already starting to venture into the internet of things (IoT). For example, one local authority in Worcestershire provides a 'lifeline' service whereby a smart AC adapter is placed between a citizen's kettle and the electrical outlet and provides usage reporting over 3G to a control centre.

When the citizen fails to boil their kettle for a period of 1-2 hours between the hours of 8am and 8pm, an alarm in the control centre is triggered and relatives/carers are informed, resulting in faster responses to potential healthcare situations.

Ideas for IoT in the UK public sector context include:

• Notifications via Alexa when the bin lorry is 10 minutes away.

• Soft notifications to carers/relatives about intelligence gathered from the homes of people under adult social care systems – bypassing the control centre for low-level notifications but allowing for escalation where intelligence indicates deterioration for instance.

• Notifications via devices and services about traffic congestion, accidents, closures, etc.

• Devices installed in municipal parking areas can inform local authorities about the number of spaces being used and for how long, helping to identify trends and patterns to enable better justifications.

• Smart street lighting enables authorities to measure lighting levels and identify faults quicker – used in conjunction with other sensory inputs it can even be possible to turn off lights to save energy when they are identified as not being needed.

• Temperature measuring devices can help healthcare providers keep a better track on the viability of drugs in transit.

• Smart waste bin developers are looking at possible solutions including solar-powered compressor bins to reduce the amount of space needed, coupled with smart notifications to local authorities about when the bin is full, allowing for better resource planning.

• Using 'beacons' it is possible to push notifications to smartphones based on locations to give people additional information about a place – for example a museum or tourist attraction.

• Extending the 'lifeline' approach, the buttons worn by clients can be programmed by authorities to trigger actions that are more than just setting off an alarm. For example, two presses can have a different action than one press or a long press.

• Deployment of sensors at key points in the water network, or even by installing sensors at the home-side of the network, would allow water management companies to monitor for faults and leaks more effectively in addition to detection of pollutants and contaminations.

• Smart smoke detectors can be expanded to measure CO2 and other air quality indicators in homes, reporting emergencies automatically and allowing authorities to early identify possible locations with air quality issues.

As we can see there are many public services that can benefit from IoT. Some services such as bus timetabling information is already becoming well-established whilst others will take more time and investment to unlock. Some will also require careful cultural management – for instance, citizens will likely become suspicious about snooping on learning that a council wants to install smart chips into bins.

IoT as an ecosystem is ever-growing and will require public and private sector to work more closely than ever before to enable mutual access to data, endpoints and devices. Getting this right can shape a future with smarter cities and countries.

5) Self-service channels

Channel shift has been a constant ambition for many civic organisations for a number of years, with varying degrees of success. However, a key component that drives the push for citizens to 'switch to online' is a focus on making it easier for officers to do their jobs as part of efficiency imperatives with little 'value added' benefits for the citizen to make the effort. For the citizen the message has been 'if you make our jobs easier, we can do more for less' – except the 'more' isn't often felt by the citizen, but the 'less' can often be noticed through service cutbacks.

With the opportunities provided by AI, Automation, VR, AR and smarter data the citizen is now able to be presented with some very real value-add. This could be things like better updates on progress, quicker processing, or the ever-crucial time saving imperative by not having to repeat information or go through further processes.

An example might be the future ability for a speaker on a planning application to appear virtually before the committee just in time for their agenda item, rather than having to wait for what can be hours for other items to be heard.

Self-service channels must fit the citizen, and with platforms like Facebook Messenger this is increasingly possible. Citizens are reluctant to install additional apps on their devices, but will do so if they provide additional value, so civic leaders will need to carefully consider if investment in dedicated apps is a necessary avenue, or if smarter integrations will deliver more value.

6) Intelligent Virtual Assistant (IVA)

According to research , the IVA market is expected to reach a $11.5bn value by 2024 due to growing demand for online self-service, self-reliance and rapid query resolution requirements. The latter of these drivers is key in the public sector context where discovery of information, policies and procedures remains a major resource demand as the queries are often varied in nature and diverse across many service areas. For example, someone wanting to become a taxi driver will want to know how to apply for a licence, whilst another resident might simply want to know what day their bins will be emptied having just moved to the area.

Websites are becoming the preferred channels for citizens to use to find answers, whether on desktops or increasingly on mobile devices. With the rise of voice assistance devices like Alexa the traditional channels operated by public sector bodies are faced with a clear need to evolve.

As well as providing better service the investment in IVA channels can unlock savings for public bodies through reductions in call wait times and reduced demand for customer service resources at the 'front of house'.

As of 2017, the capabilities and adoption of virtual assistants is expanding rapidly, with new products coming onto the marketplace with a strong emphasis on voice. Apple, Google, Amazon and Microsoft are all investing heavily in devices that provide IVA services.

In addition to the services widely advertised in the consumer space such as operating lights and entertainment systems there are additional services that can be provided through IVAs such as:

- Details of local traffic conditions and road closures
- Opening hours of local leisure facilities with details of costs and services provided
- Scheduling appointments
- Droviding information about complex areas of policy or law
- Assistive services to support adult social care
- Guidance and support for benefits claimants
- Translation of public services for non-English speakers

For example, in Australia the government has invested in “Sam” who can answer questions about benefits payments and related information.

So whilst a chatbot is a “Tier 1” implementation of an IVA, there are many more levels for the UK public sector to explore.

7: Artificial Intelligence (use cases)

There are a range of examples where AI can contribute to the UK’s public sector, including:

• Automatic application of benefits based on intelligence around life events, such as automatically enrolling citizens for payments of Child Benefit on the birth of a child; or the automatic commencement of retirement benefits based on intelligence received from industry HR departments and payroll processes.

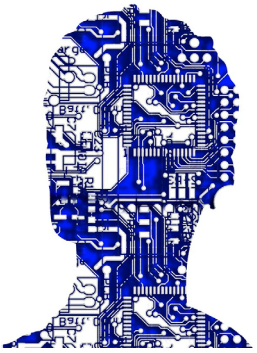
• Classification and prioritisation of calls for services, including emergency services calls.

• Detecting and preventing the spread of diseases and other health issues based on more advanced modelling and greater inputs.

• Assisting public servants in making decisions around benefit entitlements, discretionary payments, immigration decisions and more.

• Adjudication of legal matters.

• Monitoring of social media for public feedback on policies in addition to monitoring to identify emergency situations or emerging threats.



• Identifying fraud quicker.

• Predicting a crime and recommending resource adjustments in a pre-emptive manner.

• Predicting traffic congestion and car accidents, allowing for proactive measures to be deployed.

• Anticipating road maintenance requirements – fixing pot holes before they even appear.

• Identifying and automatically acting on breaches of health and safety regulations.

• Providing more personalised experiences from education to customer services across all interaction points.

• Assisting with defence and civil contingencies.

• Automatically detecting and acting upon breaches of intellectual property rights.

8) Big Data

Local, regional and national level public sector bodies across the UK have come a long way when it comes to acquiring and using big data.

From the availability of high-resolution satellite imagery to census records, public sector bodies have a wealth of sources to tap and put to use for greater social good. However, for many, big data is still a 'new frontier'.

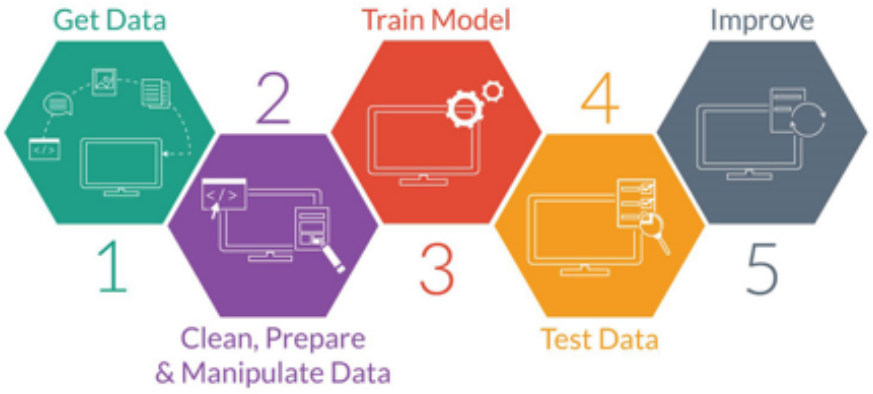
> "In government, we get this. We've always held enormous quantities of data – now we need to make sure we use it properly. Getting this right is the next phase of public service modernisation."
>
> — John Manzoni, Chief Executive of the UK Civil Service

It was only in June 2016 when the Land Registry and partners published the first ever UK House Price Index, providing for the first time a single source of information as opposed to multiple competing versions. This data has allowed a range of information-based services to flourish. From whether rude-sounding street names have an impact on house values, to whether a house is on a floodplain by overlaying data from the Environment Agency.

In healthcare, Moorlands Eye Hospital produces 3,000 scans every week but analysis of this takes time and traditional tools are unable to explore the data fully. Working with DeepMind, the scans are anonymised and processed using machine-learning technology. This can detect and learn patterns from the data to provide early diagnosis opportunities.

In crime prevention, the Home Office uses big data and machine learning to increase the speed of analysis of suspect's computers and devices. It is suggested that a case involving around 10,000 images would take around three days to review and categorise, but this now takes around an hour. This improvement in efficiency has not resulted in fewer jobs – it has resulted in more time for officers to spend putting together prosecutions.

More than 8 million citizens have signed up for personal tax services on the HMRC website, allowing them to see summaries of where their tax pounds are spent.



Resource to help and explore

4 Roads is an intelligent self-service agency with expertise in the delivery of community solutions, AI, virtual reality, augmented reality, machine learning and much more.

We recognise the challenges and opportunities faced by the UK civic sector, and we've invested in this space with our hiring choices and our strategy to work with more public-sector bodies to deliver transformative change.

4 Roads can help you identify solutions to deliver intelligent self-service to your customers and staff, enabling them to help themselves with less effort.

Discuss this paper

As leaders in the development of community spaces, 4 Roads believes in the power of collaboration. That's why we've launched a LinkedIn Group to facilitate discussion, networking and resource sharing.

https://www.linkedin.com/groups/8869008/