
Solving Public Sector problems through open data

A Proposal for the
Public Sector in
Wales

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Contents

Introduction.....	3
Aim	3
General Outline	3
Open Data	4
The Next Steps.....	4
Approach	5
Phase 1: Define the scope of the Programme.....	5
Phase 2: Identifying the current Position	6
Phase 3: Developing the Proposition	6
Phase 4: Implementation and Ongoing Programme Management	7
Summary of Work Outline Plan.....	7
Delivering Economic Benefits.....	8
Known Resources and Funding	8
Experimentation Costs	8
Minor Additional Costs:.....	9
Longer Term: Anticipating the requirement	9
Leadership	9
Long Term Deliverables.....	9
Conclusion	9
Annexes	10
Annex A: Arloesi Background	11
Annex B: Endorsements	14
Annex C: Creating a Public Service Information Infrastructure	16
Annex D: The Chief Data Officer	19

Introduction

This paper is the result of Cymro Cyf's recent and detailed engagement in the Welsh Government sponsored Open Innovation programme (run under the name of Arloesi, details of which are at Annex A) at Airbus Defence and Space where Cymro contributed to the strategic development direction, external relationship management and overall vision for the development of the pilot programme relating to Public Sector opportunities.

The overall benefits of the pilot programme will be detailed in full in an Economics Benefit Report that Airbus Defence & Space are producing as part of their closure to the programme which has now come to the end of its Government funded life. However, it is clear that there is much potential in the seeking to transfer the value and lessons learnt to the Welsh Public Sector.

In addition to the support gained in the last year (endorsements at Annex B), more detailed discussions with Ministers and Officials have made it clear there is a valuable role for the programme to play in helping to develop the Public Sector Open Data agenda in Wales. This needs to be set in the context of Airbus strategy shift in the course of the programme that has led to its withdrawal from the public sector markets. Consequently any work going forward needs to be funded by the public sector, with only "in-kind" support from Airbus in the near term.

It is clear however that Airbus Defence and Space are prepared to facilitate the setup and hosting of an environment to support transition as well as to provide operational support for systems. This of course fits well within the context of the early stage creation of an Airbus Technology Park in Newport that is the subject of a Memorandum of Understanding between Welsh Government and Airbus.

Momentum is key, and as a result it is hoped that this programme can be funded as quickly as possible to ensure that no progress or success to date is lost.

Aim

The aim of this paper is to propose how the learning experience and relationships developed during the 18 month pilot programme can be made available to support the Minister for Public Services to drive forward an open data agenda in Wales, whilst also delivering economic benefit to Wales.

General Outline

The Minister for Public Services has identified a goal to 'solve public sector problems through open data' in order to provide improved services and eventually efficiency.

In order to achieve this you must first 'Open Up Data' and of course that will need to be preceded by an audit phase to identify the data sources and systems currently available.

As a result of the experience gained in developing and supporting the recently completed open innovation programme at Airbus Defence and Space, we believe that the Cymro Cyf could play a valuable part in helping to develop and deliver a coherent plan to drive forward the open data agenda in Wales in a way that will help the public sector to solve problems through open data. We have also secured the agreement of Airbus to support this work by:

- Transferring the Arloesi brand name and trademark
- Providing office, meeting and engagement facilities at their Newport site
- Access to 3D modelling of Newport
- Access to visualisation suite
- Support for programme management
- Provision of a geo-spatial system for inter-agency data sharing should that prove to be of value
- Provision of a data hosting environment that will be in Wales

Open Data

There is an increasing level of interest in Open Data and some early thoughts on how this proposal could interact with that growth are at Annex C. It should be noted however that open data “movements” are already establishing themselves in Wales and could be a great force for good if handled well. Conversely they could be disruptive if not handled sympathetically. It is our view however that they should be seen as an asset to be tapped for support at all times.

We are convinced that there are citizen groups who would be willing to work on open data challenges if data were available to them, this is a marked change from normal ways of working and Cymro Cyf is already engaged with local open data groups in Wales and is well placed to exploit this goodwill developed as a direct result of the Arloesi Innovation pilot programme

The Next Steps

Consequently our view is that the next steps should focus on assisting officials to develop a fully-costed, coherent plan that will meet the objective of “solving problems through open data”. The work will:

- Identify Stakeholders
- Identify Data sets available
- Identify Systems available
- Gain Commitment from appropriate bodies
- Identify the data sources available that can be shared within and outside Government

- Establish the vision across the Public Service and develop a network of support and local champions for change in a data driven era
- Plan and develop the appropriate Infrastructure and governance arrangements for data management and sharing
- Investigate and recommend the optimal way of managing the opening of data in Wales with GDS as a potential model
- Develop a full costed proposal for a digital living laboratory for data driven experiments
- Develop support from the academic sector in Wales
- Develop support from the private sector in Wales, where appropriate
- Stimulate wider citizen interest in the use and exploitation of Open Data
- Develop a network of businesses in Wales to support this agenda
- Act as the neutral ambassador for this approach. .

Approach

We see this work being done in 4 discreet phases where the knowledge and experience from the Arloesi programme are transferred or exploited as appropriate over the course of the next 12 months:

- Define the Scope of the Programme
- Identify the current position
- Develop the detailed proposition, including the Governance mechanisms and funding requirements
- Implementation planning

Phase 1: Define the scope of the Programme

This is a short (one month maximum), but important phase that will define what is to be included in the programme, and perhaps more importantly what will not be covered. This will include:

- Defining what is meant by “solving problems through open data”
- Defining the extent of involvement of government, local government, public bodies, academia and the private sector in Wales.

There are many options on what the real focus for this work could be and it is extremely important to clarify the objectives. Will the priority for subsequent phases focus on: some or all of:

- Local Authority boundary reorganisation mapping
- Improving citizen experience through better service delivery
- Extending the work done with Newport CC

Phase 2: Identifying the current Position

This 3 month phase will identify the key players, the work done to date in this area and secures contact with individuals and organisations as required. It will also help to open up the new relationships required for success.

The likely groups to be involved (subject to any steer in priority) are:

- Welsh Government staff running programmes of relevance
- Local Authorities
- Public bodies in Wales
- Universities involved in appropriate research in Wales (E.g. Cardiff University Social Sciences project SPARK)
- Private sector organisations and individuals who have expertise to offer in Wales
- Potential working groups of stakeholders to form the vision and outline programme of action

The output from this phase will be a report that defines the current position, and provides a foundation for further action. The report should be seen as a business case to support the investment required to further develop the open data agenda in Wales.

It is unlikely that the output from this phase will be for publication externally.

Phase 3: Developing the Proposition

Once the vision and goals are established it will be possible to develop the detailed proposition in a 6 month phase. This will be done with a wider, virtual team that could include (not exclusively) representatives with responsibility for local authorities, government officials etc.

The output will be a fully costed proposal for the open data agenda in Wales and is likely to focus on a number of tightly defined challenges to provide focus to the work.

The programme will require a governance framework to ensure its successful ongoing management. Whilst we should not pre-judge any structures, it is likely that there will be:

- A programme steering board
- A programme management board

The composition and function of each of these will be determined during the establishment phase and will be influenced by the focus of the programme. However it is likely to include representatives from government, public, academic and private sectors.

Phase 4: Implementation and Ongoing Programme Management

The critical stage of “doing” will be based on all previous work and cannot be forecast in detail at this stage. However with all of the above in place we will be well placed for Programme Delivery effective from early 2016.

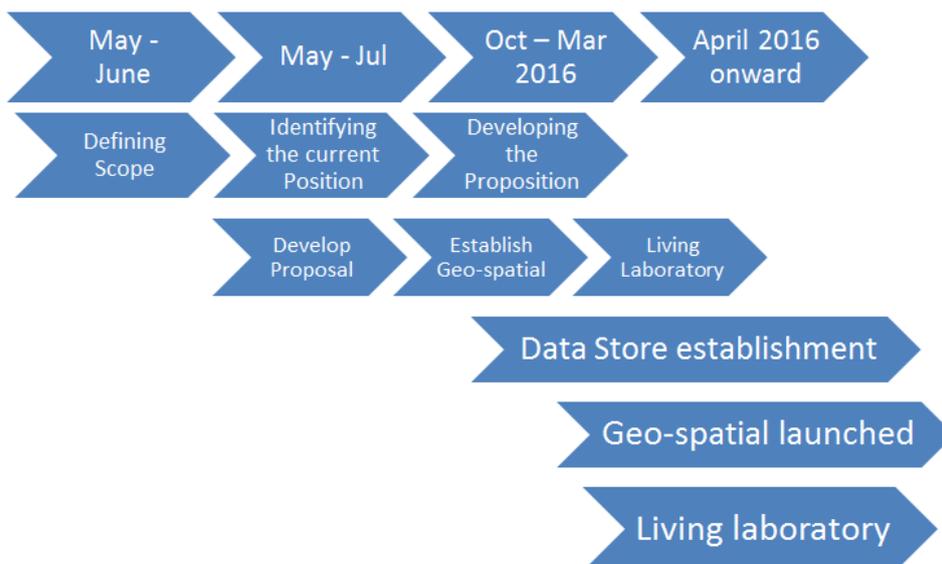
Our experience to date suggests however that the next steps are likely to be developed around the three components of:

- Data Store
- Geo-spatial systems
- Living Laboratory

Irrespective of the outcome, we will require ongoing programme management for the foreseeable future, until this approach to work is seen as “business as usual” of the programme. This management will be responsible for:

- Ensuring programme goals are achieved
- Reviewing progress and establishing causes of variance to plan
- Review of programme budgets
- Review of plans and presentation of recommendations for action
- Providing the support to programme governance to ensure smooth running
- Generation of Ministerial briefings as required
- Communication of the programme and its benefits both to the public sector and also the economy of Wales

Summary of Work Outline Plan



Delivering Economic Benefits

Whilst the London Data Store was established by the Greater London Authority initially as an aid to economic development, the belief being that opening up public data would encourage businesses to develop “solutions” based on access to the data. This has proven to be hugely successful.

The further upside to that early intent is that the Data Store now provides a capital wide data dashboard based on a range of definitive data sets that act as the reference for the performance of the city. This is a great aid to transparency and accountability, as well as an aid to scrutiny. Furthermore, the central data store now acts as a focal point for the sharing of data across London Boroughs and also ensures that data requested by one body is made available to other bodies at little extra cost. They develop once and develop for all.

The Data Store also stimulates “challenges” to encourage open data champions (volunteers) to address local problems and to produce data driven solutions proposals. This is a great way of gaining voter engagement and also access to solutions that may not have been addressed in the past. It therefore stimulates localism in a manner not seen before.

All this is of great economic benefit to the businesses and citizens of London and is likely to be replicated in Wales during the programme.

Known Resources and Funding

2 people are required to undertake this work and both the individuals have been engaged on the work in Airbus for the last 18 months and are able to “hit the ground running”. As a result they are able to ensure that the momentum that has been created by the Arloesi programme is not lost, nor the relationships developed wasted.

The resources required to undertake this work are:

- One programme director and relationship manager: 10 days minimum per month
- One programme support (from Airbus) 5 days per month

The combined cost for this is £8,500 per month.

- Subject to the utilisation of the shared geo-spatial system there may be a need for One data administrator at a rate to be determined. This could be a secondment from WG to be trained by Airbus Geo Spatial team.

Experimentation Costs

Additional funding for experimentation may need to be found by the Minister PS on a case by case basis for experiments in the Living Laboratory or for the fast tracking of any experiments in the Living Laboratory environment.

Minor Additional Costs:

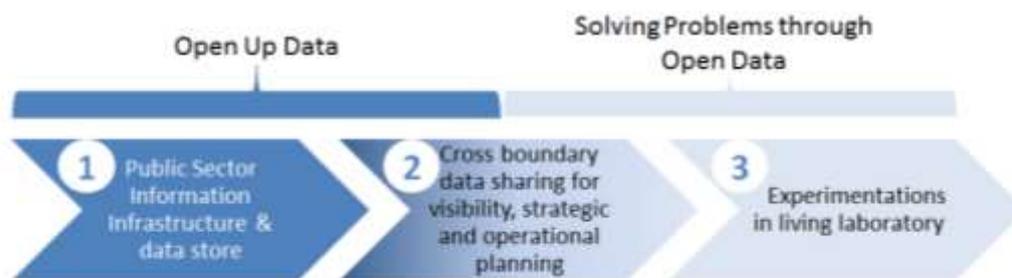
There will be occasional need to fund conferences workshops etc yet to be determined, although the access to facilities at Airbus will reduce these costs.

Longer Term: Anticipating the requirement

Earlier briefings to ministers and discussions with officials have focused on outlining a model consisting of three essential components that we would call the necessary **Public Service Information Infrastructure (PSII)** to deliver an open data agenda in Wales. There is more detail about the elements of the PSII and their possible costs at Annex C.

- National Datastore
- Geospatial shared services
- Living laboratory for data driven experimentation

Whilst the outcome of the proposed work should not be prejudged it is likely that we could see the following linear development:



Leadership

Critically allied to this is the need to establish a cross-cutting role to lead the charge in the Welsh public sector to provide leadership and direction to the programme. This should be seen as mirroring the recent UK Government appointment of a Chief Data Officer. The exploration of this role should be part of the first phase of work and some early thoughts are at Annex D.

Long Term Deliverables

It is not possible to propose clear deliverables for 2016 and beyond as they will be detailed in the work to be done for the rest of this year. Some examples of possible structures and costs are at Annex C.

Conclusion

The work done in the Airbus programme by Cymro Cyf and the relationships already in place provide a fast-start to the goal of “Problem Solving through open Data” and the early acceptance of this proposal will allow for the momentum of the progress to be maintained.

The staff required for this project are available for an immediate start.

Annexes

A: Arloesi Background

B: Endorsements

C: Creating a Public Service Information Infrastructure

D: The Chief Data Officer

Annex A: Arloesi Background

The pilot programme was 100% funded by Welsh Government Ministers and utilised the following resources:

Activity	Resources from:	Numbers
Programme Governance and Project Management	Airbus DS	2 part time
External Relationship management, strategy and demand creation	Cymro Cyf	One person, part time
Enterprise Architects	Airbus DS resources	Work package tasking
Modelling	Airbus DS resources	Work package tasking
Simulation support	Airbus DS resources	Work package tasking
Geo-Spatial Mapping	Airbus DS	Contracted system delivery and on-call support by GetGeo.

Findings

The Arloesi programme focused on an experimentation programme in Newport, looking at how to create a safer city centre environment, in particular at night to the benefit of the local economy.

The intention was to undertake this programme in a Digital Living Laboratory established at Airbus, utilising ‘enterprise architecture’ methodology developed in defence markets in recent years to solve complex problems.

The outline approach was:

- Identify problem owners and refine to a single, bounded challenge for analysis
- Workshop the challenge with stakeholders to identify its inputs, outputs and dependencies along with the technologies, policies, process, governance, training, logistics and human elements that impacted the problem.
- Interviews to validate findings and design the experiments
- Model Creation
- Simulation to test experiment scenarios

Lessons Learnt

Lessons were learnt internally and externally. The principal ones include:

External Lessons	
Interest and Understanding	It is clear that there is an appetite in parts of the public sector for an enterprise approach to problem solving. It is also clear that problems are not always addressed from a data driven solution. Data is often confused with statistics rather than being seen as a tool to assist in decision-making from an informed base.

Potential	There are some people who can see the long-term potential of a data driven approach, with the vision for real-time and experimentation dashboards that model city living been clearly articulated.
Sharing	There is little evidence of a culture of sharing across much of the public sector. Whilst many organisations declared an interest and intent, it became clear that many internal obstacles were created or existed to prevent the sharing of data.
Cross Boundary Facilitation	Whilst the concept of an enterprise approach to the management of a city, or region, was clearly accepted, there are real and practical obstacles to its implementation. Organisations work in silos, budgets restrict cross departmental working and the notion of total cost of decision-making would be difficult to adopt.
Viability of Living Laboratory	The living laboratory is a challenging concept to articulate but once it was brought to life and visualisations of solutions was seen its value became more obvious.
Data Management	We identified reservations in the management of data and more importantly its release and have suspicion that this is in part driven by fear rather than practicality. At one level we believe some individuals would feel threatened by open data whilst others value its closed nature as knowledge is power.
Leadership	Where will this come from without a Chief Data Officer? It was clear that you need a 'nucleus' for open data sharing to galvanise around. This function, department, team, person needs to be independent for the stakeholders to 'trust' with sharing data.

Internal Lessons	
Relationship management	Data becomes of value when it is 'fused' with data sets from other data providers. It allows you to quickly visualise and understand complex problems and assess the impact of changes to the environment across multiple organisations. Central to creating this environment is managing relationships with data owners to ensure they get the most out of their data. There is a great focus on developing 'trust' which needs to be established over time through a targeted and sustained relationship management campaign. This can only come from regular, focused and trusted communication relationships.
Value of the Brand	The Airbus name was useful in opening doors and to develop working relations at senior level. Airbus was seen as a 'natural', 'trusted' party to represent the different views of the stakeholder community.
Need to start at the beginning	The expectation was that the Living Laboratory was transferable, however whilst it is a useable model it can only succeed if the

	fundamentals of data are in place. As a result it is now firmly believed that the establishment of a data store is the foundation piece, from which co-working and experimentation will flow in due course.
Data Management	There is a need for committed resources to support data management and the part-time nature of the pilot program was not the optimal solution.

Principal Findings

The programme was well received and has much enthusiastic support across elements of the Welsh Public Sector. A selection of endorsements is at Annex B.

However, whilst the intention was to create experimentation space, from which all else would flow, we had not anticipated the differences between the military markets (the source of this methodology) where hierarchical management can direct activity and the public sector market, where top down direction was less suited. This was a fundamental flaw and it is now clear that any change in this area must come from a far more collaborative approach which will need a period of communication and demand stimulation in the early period.

Assets Transfer Programme

There are 2 types of asset to transfer from the pilot programme to Cymro Cyf:

- **Tangible Assets**: Office facilities, technical solutions, mapping, 3D models, data management solutions are all available to be transferred from the pilot programme. These will be supplemented by the semi-physical assets of the Arloesi name and Trademark.
- **Human Assets**: Relationships with the public sector are embed with individuals contracted to deliver the pilot programme, and are transferable, as are the learnings in terms of programme management and methods to be used to develop the programme.
- **Goodwill Contribution**: Airbus DS wants to make a positive contribution to the advancement of this programme and is willing to house the work for the next 12 months, offering not only the physical assets above, but also access to facilities for meetings and project workshops that will be required to establish the NII and Living Laboratory. This “big-brand” neutrality is seen as a key enabler for the next phase of work.

Annex B: Endorsements

Newport City Council	Will Godfrey Chief Executive	Government in all its guises produces a great deal of information but is often knowledge poor. The importance of the Digital Living Laboratory is that is helping to bridge this gap. By using data from across the public sector the Living Lab is enabling us to look at challenges in public service deliver in a totally new way. It truly has the potential to transform how we do things and make our service more responsive to the needs of our communities. This is a project which is vital to improving the public services provided in Wales and beyond. A great deal of work has been done to begin the project and it would be a real concern if this now came to an end.
Welsh Ambulance Services NHS Trust	Mike Coupe Director of Strategy Planning and Performance	The concept is intellectually sound. The challenge now is to apply it! I fully intend to get back to you to explore its application to Ambulance Services in Wales.
Newport City Council	Debra Wood-Lawson Head of Service - People and Transformation	<p>We have been working with the Arloesi team to test out with our partners a different approach to city planning thereby bringing with it a more effective focus for resource deployment and decision making. Organisations have considerable data assets and when mapped into a bigger picture it enables a more rounded assessment of the ‘problems’ and provides simulator testing of the various options available.. Whilst our work with Arloesi is at an early stage the ongoing benefits of working with partners in a different way are already understood.</p> <p>The benefits we set out internally are: A cost effective tool that allows us to better understand the impact and implications of decisions taken in relation to the city centre, prior to them coming in to effect. This should allow us to: Try things out ‘virtually’ before making the case to implement them Better engage with stakeholders and partners</p>

		<p>and make decisions that are mutually beneficial</p> <p>Better consult with the public over improvements with a sound evidence base of the impacts and clear descriptions of the proposals improve the city centre in a cost effective and sustainable way.</p>
Cardiff University	<p>Professor Rick Delbridge PhD Dean of Research, Innovation & Enterprise, Cardiff University Professor of Organizational Analysis, Cardiff Business School</p>	<p>As we discussed, I see the Lab as having a number of areas of activity that are potentially complementary to plans at the University.</p> <p>In particular, the work we are planning as part of the major Innovation System investment here in Cardiff will also develop models and visualisation to aid in communication and understanding of the evidence. Activities we are developing in conjunction with Nesta and Welsh Government will draw heavily on research and evidence bases for decision making.</p> <p>In short, I see the Lab as having made good progress in its formative period and would be pleased to see the initiative continue. I would be happy to discuss the potential for future collaboration as both our plans and and yours begin to crystallise.</p>

Annex C: Creating a Public Service Information Infrastructure

The processes for developing the PSII can be outlined as follows:

- Identify and maintain an inventory of data held by government and the public sector in Wales
- Prioritising data to be included in the PSII
- Supporting organisations to release data, where possible

Funding a Public Sector Data Store

The costs of establishing a data store are “reasonable” with most running on open platforms, and being implementable for less than £30,000. They would require some support staff, but these could be funded within the proposals above.

- Initiate a programme of data release. It is anticipated that the data releases will be internal to the Public Sector until otherwise decided to open to a wider open-data agenda.
- Establish Geo-spatial system for all Wales PS data
- Share initial (100?) Data sets

Additional Resources required:

- Data scientist – could be seconded from WG
- Data Store Administrator – one person, could be seconded from WG
- Data Store User interface developer – could be seconded from WG
- Api Developers – likely to be recruited

Development of a National Geo-Spatial Information System

We have received tacit agreement from the Airbus Geo-Spatial Intelligence team to make available a geospatial system to support the creation of a national information infrastructure; this could be deployed in parallel to or instead of existing systems subject to investigation. There will be a need to resource this system and that cost will be addressed in the planning phases.

It is worth noting that there are parallel embryonic plans within Airbus to make use of facilities in Newport, including the relocation of technical infrastructure, consequently all data would be hosted in Wales.

This system will allow us to “Map Wales” and initiate wider cross boundary sharing of information for planning and operational purposes as well as for the support of Local Government reorganisation. This would be a mix of Open Data, Restricted Open Data controlled through access control permissions and Closed data solely for WG use.

Additional Resources required:



- Geo-spatial system admin – one person, from Airbus Geo Spatial Intelligence team (costs fully recovered from WG via Cymro)

The Living Laboratory.

The Living Laboratory is currently stalled but as can be seen from the endorsement from the Newport CC Chief Executive there is great desire to continue with its development. With no firm plans for the development of experiments it is difficult at this stage to detail the resources required, but a range of options are offered at Annex D

Resources: The following resources may be required:

Programme management	Ensure tight programme management Ensures Knowledge Exploitation and transfer across bodies who might benefit from lessons learnt. Built once, share for all.	One person
Relationship management	Required to ensure the creation and management of a stakeholder community and that all parties are aligned to the successful delivery of the outcomes	One person
Enterprise Architects	Required to map the problem and develop the tight definition	Draw down dependant on demand
Experimentation teams	Likely to use a model of 90 day projects supported by a focused team of 4 or 5. The budgetary estimate is circa £75,000 per project	One senior data scientist, 2 x data analysts One user experience designer
Open Data Projects	Ad-hoc citizen engagements focusing on projects that add value to their communities and also the greater good.	Variable

The detailed plan for a living laboratory cannot be produced now as far more investigation is required. In outline terms however it is a logical extension of the work outlined above and can be scaled dependent on challenges to be addressed.

Examples of possible problems for analysis could include:

- Analysis of M4 Relief Road around Newport to reduce traffic accidents in particular around the Brynglas tunnels
- Mapping City-Region benefits and Metro impact
- Transport planning for predictive motorway traffic management
- Improving city safety through infrastructure mapping and right sizing.

- Predictive ambulance siting to improve incident response times

Operating Model and Costs

The Living Laboratory would work operate on a “team per project” basis. The teams are likely to consist of no more than 5 people, with a 90 day solution timetable. The team would consist of some or all of the following:

- User interface developers
- Data Scientists
- Data Analysts
- Enterprise Architects

The estimated cost of such a team is circa £300,000 per annum, or circa £75,000 per project. These costs are only indicative, as some work could be done at zero cost by motivated citizens, whilst other work could be done by seconded Government employees or even private sector contracts.

Annex D: The Chief Data Officer

The CDO should be the “ambassador” for the digital data vision and engagement with local authorities, devolved governmental bodies and other agencies data officers within individual departments to build support will be essential. Arloesi has managed this cross-public sector relationship development successfully and is well placed to continue to do so.

The CDO will need to generate support across the public sector to attain a cohesive public sector data landscape. As this is a complex landscape the CDO will need to be able to articulate the art of what is possible. The CDO should

- Develop, shape and gain endorsement for the digital data vision
- Audit existing data sources
- Develop a network of Data Champions
- Develop a citizen focus to deliver better services
- Communicate the vision and stimulate support
- Provide user focus
- Share best practice
- Develop Data Standards
- Manage pipeline of data release
- Develop training needs analysis and facilitate training
- Identify further uses and benefits of government and public sector data