

FUTURE CITY • GLASGOW

OPEN GLASGOW



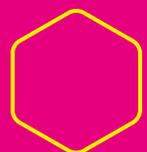
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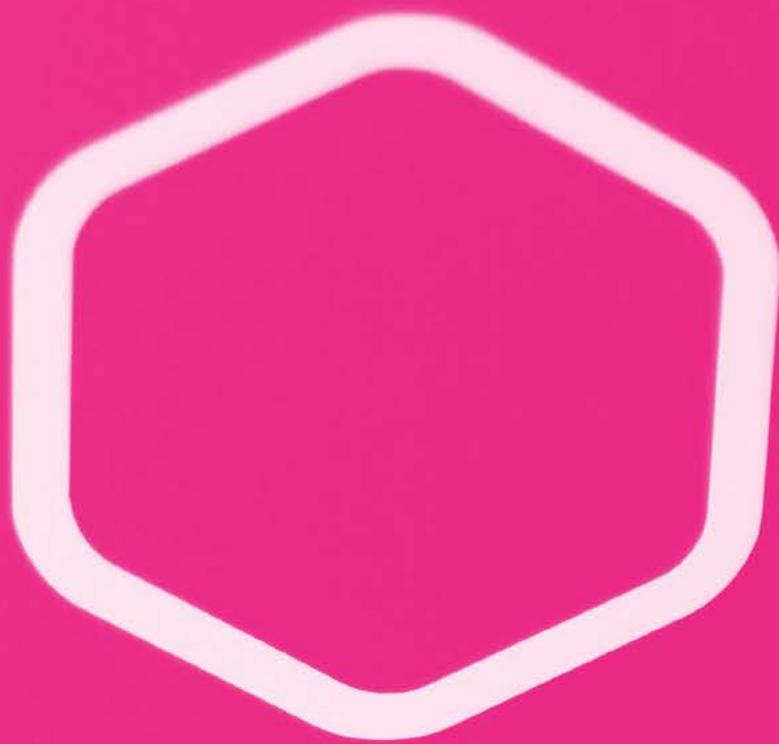
Future City Glasgow

Build Phase

City Data Hub
Demonstrator

Published Date: July 2015





OPEN

GLASGOW

OPEN Glasgow End Stage Report

Future City Glasgow

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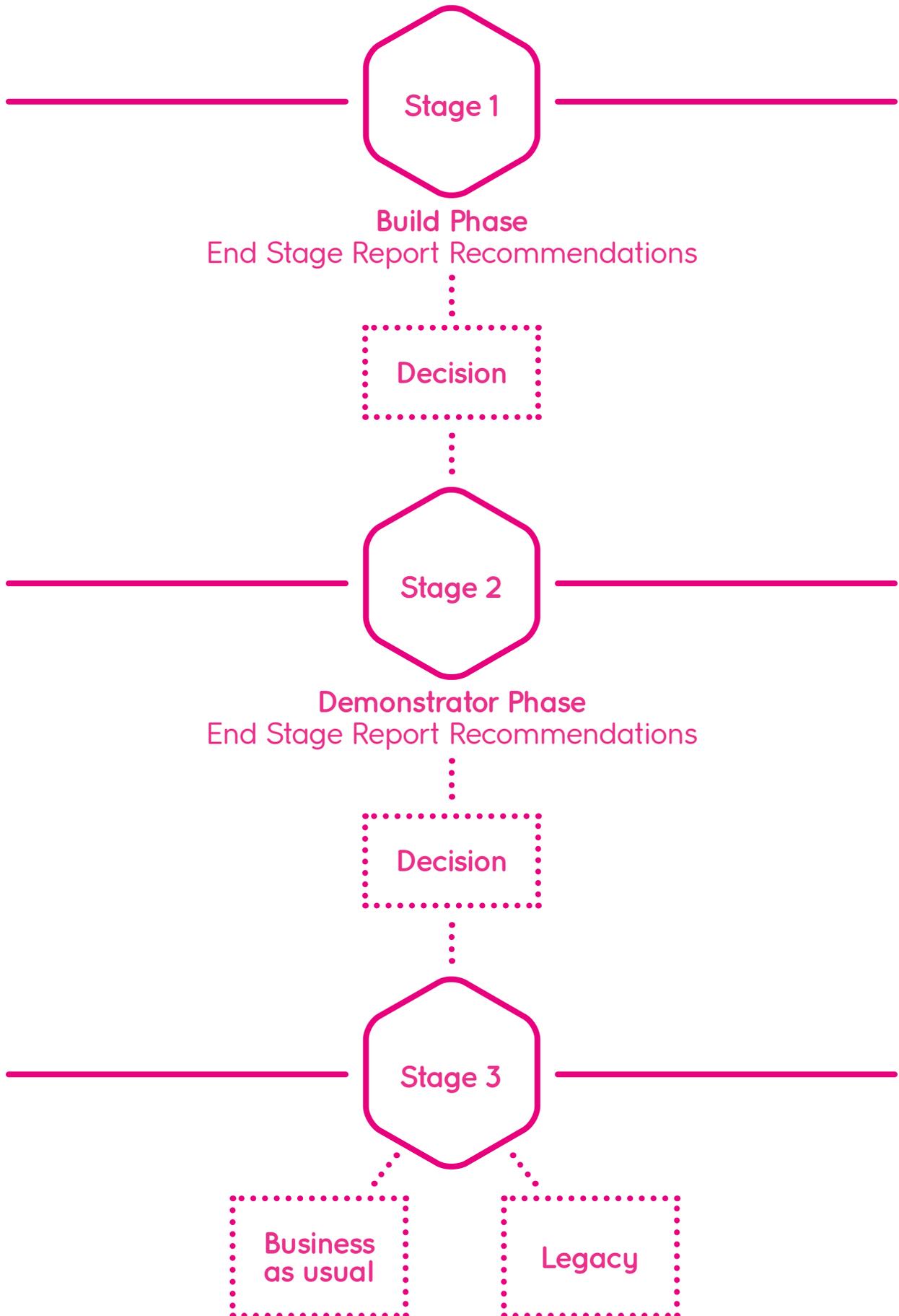
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Introduction

This document provides an overview of the project reporting within the Future City Glasgow programme, summarising progress to date on the build phase of the Open Glasgow programme.

The recommendations contained within this document will provide the basis for formal approval of the Open Glasgow programme and workstreams contained therein, proceeding to stage 2 demonstrator phase.

Project Structure



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Overview of Stage 1:
Build Phase

Demonstrating how Open Data can enrich every part of city life; from city decisions to engaging citizens.

2.1 Objectives

The objectives of the Open Glasgow programme are to:-

- Improve viability of new businesses – demonstrate how the use of Open Data can provide insight for new businesses on consumer behaviour.
- Enrich views of the city – demonstrate how the use of Open Data and mapping technology can provide more information to citizens.
- Improve response from city services – demonstrate how the availability and use of Open Data can provide support to decision makers to deploy pro-active city services.
- Improve Economic Growth – demonstrate how the use of Open Data can support economic growth of the city by providing insight to local business.
- Improve visibility of assets within communities – demonstrate how the use of Open Data and mapping technologies can inform citizens and communities of the location and availability of assets and services.
- Improve decision making – demonstrate how the use of Open Data can provide an informed opinion for decision making within the city.
- Provide the basis for collaborative working – develop a citywide collaborative approach through the use of innovative technology and Open Data.
- Improve engagement with communities – develop smarter engagement plans for communication with communities through the use of available technology and crowd-sourced data.
- Empower communities – demonstrate how the use of Open Data can empower communities and groups to embrace change and improve local areas.

2.2 Scope

The Open Glasgow programme was grouped into the following structure and scoped as:-

City Data

- Publication of an Open Manifesto.
- Publication of Open Data.
- Agile development of a prototype Open Data catalogue.
- Agile development of a prototype map portal.
- Agile development of a community map that can be curated by communities.
- Agile development of a prototype “City Dashboard”.
- Development of a “semantic web¹” linked data catalogue.

- Development of a Strategy and Reference Architecture for a strategic platform for publishing and using Open Data.
- Procurement of a strategic platform for publishing and making use of Open Data.
- Implementation of a strategic platform for publishing and making use of Open Data.
- Integration of Council systems to the strategic platform for publishing and making use of Open Data.
- Integration of Future City Glasgow projects to the strategic platform for publishing and making use of Open Data.
- Development of Open Data publication processes.

City Innovation

- Prototype development of a new MyGlasgow app.
- Development and end-to-end integration of the MyGlasgow app.
- Organisation, marketing and implementation of four hackathon events.
- Development of a “Future Vision” for the MyGlasgow app.

City Engagement

- Development of an online social media user base.
- Development of Data Stories to explain the value of data.
- Development of multi-media to explain the value of data (including videos, infographics, etc).
- Organisation, marketing and implementation of mapping events with communities.
- Organisation, marketing and implementation of Future Makers initiative for school children.
- Design and build of a physical Engagement Hub complete with AV and multimedia.
- Organisation, marketing and implementation for Engagement Hubs.



¹ The Semantic Web is an extension of the Web through standards by the World Wide Web Consortium (W3C). The standards promote common data formats and exchange protocols on the Web, most fundamentally the Resource Description Framework (RDF).

Current Position [cont.]

2.3 Resource

Data	Technical	Engagement	Hackathon
Programme Manager	Lead Architect	City Engagement Lead	Hackathon Lead
City Innovation Lead	Developer	Events Co-ordinator	Programmer
City Data Lead	Business Analyst	Engagement/Literacy Project Manager	
Data Lead Officer	Designer	Storyteller Project Manager	
Data Officer (x 3)	Technical Programme Manager	Social Media Engagement Officer	
	Technical Architect		
	Test Manager		
	Security Consultant		
	Web Developer		

Not all resources noted above were committed to the programme full time or for the full duration of the Future City Glasgow programme.

2.4 Deliverables

The Open Glasgow programme has achieved the following deliverables in build phase:-

A. City Data

Working with new innovative technology, Open Glasgow has built and created city assets to share Open Data providing a platform to explore the opportunities of Open Data.

City Data Hub

A world-leading scalable big data platform which provides the following capabilities to make the publication of Open Data sustainable and scalable across organisations and the city:-

- Multi-organisation data publication which allows trusted organisations in the city to manage their own Open Data.
- A configurable work-flow that allows organisations to manage their own data publication processes (for example for automating the workflow of data quality checks, data privacy checks before data is published).
- Automated upload of data from organisations own business applications (see City Data Hub Integration).
- Audit and logging of all data publication.
- Anti-virus scanning for all files uploaded.
- A set of Open Application Programming Interfaces that allow developers to innovate with the City Data Hub.
- A suite of applications for managing Application Programming Interfaces to improve accessibility to data for developers. Big Data Analytics capabilities include real-time data analytics (using Hadoop²) and Machine Learning³.

City Data Hub Integration

Integration to the Data Hub from key Glasgow City Council Business Systems to allow automated

publication of Open Data sets. Systems include the Council's Customer Relationship Management (CRM) system, Planning Application system, and Geographical Information System (GIS).

Open Data Catalogue

An online data catalogue that allows users to discover data made available from the City Data Hub and other sources (data.glasgow.gov.uk)

Open Datasets Published

During the build phase of the programme the Open Glasgow programme has delivered the publication of 372 Open Data sets. This has resulted in Glasgow's Open Data store becoming the second largest city Open Data store in the UK after the London Datastore which publishes 583 Open Data from across the 32 local authorities within the Greater London Authority. The number of datasets published is expected to increase further during the demonstrator period as is the scale and sophistication of the datasets now that Open Glasgow is underpinned by the "big data" City Data Hub.

Community Area Partnership Map

An interactive map of assets, services, demographic and statistics (e.g. crime, fire, etc) for a specific ward (Drumchapel/Anniesland) that can be used for Community Planning purposes by the cross-sector Community Area Partnership, including Elected Members. open.glasgow.gov.uk/load

Open City Dashboard

An online personalised dashboard that presents real-time data such as weather, the environment and traffic in a simple graphical manner to users (particularly citizens) dashboard.glasgow.gov.uk. The intention is that the source code for the Dashboard will be made open source to allow the tech community within the city to further develop the Dashboard and to allow it to be shared with other cities.

B. City Innovation

MyGlasgow App

Major improvements to the MyGlasgow smartphone app that allows residents to report issues in the city ([See more here](#)).

²Hadoop is an open-source software framework written in Java for distributed storage and distributed processing of very large data sets on computer clusters built from commodity hardware.

³Machine learning explores the construction and study of algorithms that can learn from and make predictions on data.

Improvements include:-

- New user-centric design including the use of tiles, bolder graphics and colours and the removal of non-relevant information and technical terms.
- Simplified user experience.

End-to-end integration with back office systems, with associated business process re-engineering to automate the flow of information through the Council's Customer Care Centre and Land and Environmental Services department. Real-time status updates are now provided back to the customer.

Hackathons⁴

A series of four hackathon events at four different locations, including the prestigious Riverside Museum with a total of close to 200 participants, stimulating the creation of 43 innovative "Future Cities" concepts by local students, start-ups and SMEs. Learn more [here](#).

As part of the Hackathons, the following Promotional Videos were developed:-

- [Future Hack #1 – "Public Safety"](#)
- [Future Hack #2 – "Energy"](#)
- [Future Hack #3 – "Health"](#)

Sensor Store

A summary of the IoT devices and sensors that have been used within the Future City Glasgow Demonstrator can be found [here](#).

Open Data Publication Processes

Documented processes for preparing and publishing Open Data that can be shared with all agencies within the city.

C. City Engagement

The Future City Glasgow programme is a citizen focused programme. To bring the message of the Future City programme to the people of Glasgow, a number of initiatives were progressed:

Open Glasgow Website

An entry point for finding out more about Open Glasgow and the products it provides to all users, including citizens and organisations in the city (<http://open.glasgow.gov.uk>).

Engagement Hub

This involved designing and building a static and mobile engagement hub to bring the Future City Glasgow message to citizens with the creation of multimedia videos and infographics.

To assist with the story of Future City Glasgow, a number of promotional materials were created as follows:-

Infographics

A series of static and video infographics that promote the benefits of products described above including Open Glasgow, City Data Hub and the MyGlasgow app.

Case Study Videos

A series of videos that provide specific real life case studies of the use of Open Data:

- ["Helping Glasgow to be a cycling city"](#)
- ["Helping Glasgow to be a sustainable city"](#)

Day in the Life Video

A futuristic view of Glasgow based on the themes of the Future City Glasgow programme (watch [here](#))

Engagement was not restricted to telling the story of the Future City; it included events to encourage children and communities to get involved. These events were as follows:-

Future Makers

A programme of "Coding for Kids" events for children and young adults to stimulate interest in software development. Future City Glasgow delivered in partnership with the Glasgow Science Centre and Coder Dojo Scotland - [here](#)

Coder Dojo

Scotland received recognition from Coder Dojo for this work and much of the material used within this programme has been re-used by other Coder Dojos globally coderdojoscotland.com

Future Maps

A series of community, citizen science mapping events delivered in collaboration with local social enterprise Pidgin Perfect (see the report [here](#)).

Open Glasgow Social Media Presence

The creation and monitoring of the social media presence on social media channels such as [Twitter](#) and [Facebook](#).

City Observatory

Providing data to the University of Strathclyde, to aid the creation of a physical engagement space in the Technology and Innovation Centre (TIC) where the public, private and academic sectors can meet to engage with and analyse data using a range of technologies.

2.5 Constraints

Time and Budget Constraints

The Open Glasgow programme had a mandate to innovate at scale, within a fixed timescale and fixed budget. This constraint was managed by using agile development so that scope could be varied to ensure fixed costs and timescales.

Unplanned Changes

Unforeseen changes to programme staff impacted upon scope of engagement work and development of the original MyGlasgow app prototype, map portal and community mapping tool.

GIS Upgrade

A key source of information for Open Data is the Glasgow City Council GIS system. There was a scheduled major upgrade of this platform during the demonstration phase of the Open Glasgow programme resulting in delays to technical integration, and reduced access to staff.

⁴A hackathon (also known as a hack day, hackfest or codefest) is an event in which computer programmers and others involved in software development and hardware development, including graphic designers, interface designers and project managers, collaborate intensively on software projects.



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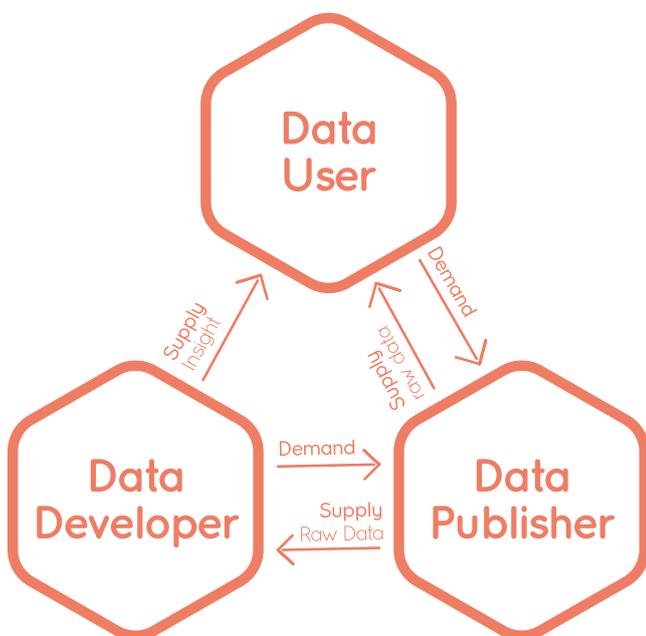
Current Position

an opportunity to work with many citywide services to start to understand the mutual benefit of sharing data

Current Position

3.1 Benefits achieved to date

The build phase of the Open Glasgow programme presented an opportunity to work with many citywide services to start to understand the mutual benefit of sharing data. To address the challenge of encouraging organisations and businesses within the city to 'open up' their non-personal data a negotiation tool was quickly created. The data proposition is explained through a value chain, where organisations begin to open up data in return for datasets that are valuable to them from others. The build phase unlocked the opportunity of the value chain however the demonstrator period will explore it in more depth, as illustrated below, to help to understand the sustainability of the approaches and technologies being demonstrated.



Within the data value chain illustrated above we introduced the role of a “data developer”. As well as a simple chain of data demand and supply between data providers and data users, the data developer role represents a 3rd party intermediate who also has a need for data but does not use the data to drive decisions, like the data user, but creates new value out of the data to empower the data user. Examples of creating additional value from data that could be provided by data developers include:-

- Linking disparate data sets.
- Standardising data formats.
- Creating a visualisation of data.
- Analysing data.
- Creating a smart-phone app that makes use of the data.

The demonstrator phase will illustrate how stakeholders within the city can play any of these three value chain roles, and in most cases play all three roles simultaneously to create value from the data and deliver outcomes such as those listed above.

3.2 Residual benefits expected

The build phase of the programme was used to create a city data platform and start to tease out the benefits of Open Data through the use of new approaches and new technology. Combining the data available and city challenges a number of key demonstration areas were determined and will be evaluated through case studies during the Demonstrator phase.

The demonstrator phase will evaluate the efficiency and productivity improvements associated with being “open by default” and support the increase of transparency of organisations, particularly public sector organisations, in line with efficiencies found.

It is envisaged that the City Data Hub will provide new insight into how the city works by being able to layer and combine data where it hadn't previously been possible. The demonstrator phase will evaluate how this new insight can be used for planning and regeneration and for providing new market insight for businesses in the city.

The City Data Hub may raise the importance of data for improving decision-making across different decision-making lifecycles within the city. Some key areas where the City Data Hub could support this are:-

- a. Investment Planning
- b. Urban Planning
- c. Service Delivery

Community engagement will be enriched by providing communities with better access to information; for example providing Community Area Partnerships with access to additional information such as assets and services provided will support and encourage improved communication. In addition, improved communication and collaboration between partners within the city through better access to common information can increase the quality of services delivered in partnership and improve resiliency.

Stimulate Innovation

empower all sectors within the city to innovate and create economic growth through better access to information. As an example, using market insight about the city to develop innovative new products and services that solve city challenges may allow economic growth for Glasgow and small to medium business owners.

Improve Partnership Working

Improve communication and collaboration between partners within the city through better access to common information to improve the quality of services delivered in partnership and improve resiliency.

Smarter use of information within service delivery may drive efficiency and productivity improvements. Using data, it may be possible to target service delivery more effectively within the city and improve the utilisation of available assets.

The City Data Hub has the potential to provide academic institutions with valuable information sets and insight which can be used to undertake, and attract funding for, research into city challenges.



Current Position [cont.]

3.3 Issues

Resistance to release Open Data

Like many Open Data initiatives there was an initial resistance to 'open up' data. Concerns raised related to how the data would be used, privacy implications, and data quality and maintenance. This issue still exists but progress has been made to remedy it by:-

- Being able to reference real users of the data and credible examples of how they want to use it
- Ensuring that concerns about privacy and data quality and maintenance are addressed. In the case of the Open Glasgow programme, the City Data Hub specifically addresses these concerns by providing a configurable workflow that includes validation checks, and automated publication from business systems.

Further work will be undertaken as part of the Demonstrator phase to embed Open Data within existing Information Governance processes.

Council Social Media Guidelines

Open Glasgow made extensive use of Social Media to engage and build a community around Open Data. This has been really successful and has helped improve the city council's own social media output in terms of replying to queries on twitter. However, there were challenges around working within the city council's social media guidelines

Balancing the simplification of "front-of stage" customer experience and Transformation of "back-of-stage" processes

During initial work on the MyGlasgow app project there was much time spent designing an improved app with a better user experience, however the effort required to re-engineer back-office processes and system integration was underestimated. In addition, a very "hands-off" approach to the back-office integration was adopted, where a specification was provided to ACCESS (the IT provider for Glasgow City Council) and it was left with them to provide a technical solution. This caused delays due to poor communications between parties, and a lack of team-working. The project was recovered following an intervention to form a joined-up working group that developed end-to-end processes (including the design, customer experience, business process design, and technical solutions) working together as a single joined-up team.

Building a developer community around Open Data

The Hackathons hosted to date provided an excellent forum for engaging talent on the city's doorstep to address city challenges. They provided a short, intense and interactive/collaborative environment for co-working and co-designing. More

work is required however to establish an ongoing relationship with the community to allow the continued development of the concepts developed during hackathons, and to bring in parallel business support from appropriate organisations in the city to help participants develop business models to sustain the development of their concepts.

3.4 Lessons learned

Forming a multi-disciplined team empowered to innovate.

Future City Glasgow is a demonstration of the power of multi-disciplinary team working and the outcomes it delivers. Given the convergence of technologies used, and the multi-faceted city challenges addressed, the programme was constructed using a broad range of skills and experience from within the City Council, partners, local SMEs, and contractors. For example;

- Creative Designers
- Technical Architects
- Domain Experts
- Engineers
- Software Developers
- Project Managers

Forming such a ring-fenced multi-disciplinary team where organisational/departmental alignment became irrelevant proved to be extremely effective, particularly when provided with a mandate to innovate.

Agile Development

Traditional development approaches to technology development focus on a "waterfall" development model whereby programmes follow a series of single and linear stages (e.g. requirements capture, analysis, design, build, test, release). Typically within organisations projects are managed in this manner to minimise risk to operational (business-critical) systems. These types of projects can be categorised as fixed scope, with risk managed in a controlled way through change controlled variation of costs and timescales.

Whilst this approach is applicable to large programmes with complex dependencies it is not best suited to programmes where there is a loose definition of scope and a need to innovate. For these types of projects agile development offers an alternative by providing a structure to prototype iteratively with users based upon a fixed cost/timescale but variable scope basis.

In practice both approaches are applicable to different scenarios; however the Open Glasgow Programme demonstrated the benefits of agile development where there wasn't a clear definition of scope and a need to evolve requirements over time through continued user engagement.

engaging talent on the city's doorstep



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Recommendations

The recommendation is to proceed to Stage 2 Demonstrator Phase. This recommendation is based on the experience gained in Build phase.



Recommendations

The Demonstrator phase of Open Glasgow will include the following activities within scope:-

Support and Readiness Activities

Activities to support the technology solution delivered during the build phase and knowledge transfer to Council services, Arm's Length External Organisations (ALEOs) and relevant partners.

Testing and Evaluating Projects

A series of projects that allow benefits to be evaluated to inform future investment decisions and to package up Glasgow's experience for other cities; in particular, projects will be undertaken to evaluate the benefits:-

- In increasing transparency
- For Community Engagement (in collaboration with GCC Democratic Services)
- For Service Reform (in collaboration with Service Reform, Land & Environmental Services and Community Safety Glasgow)
- For Planning and Regeneration (in collaboration with Development & Regeneration Services)
- In increasing innovation (in collaboration with Development & Regeneration Services)

Funding and Business Model Activities

Further activities are required to support funding opportunities and/or the

development of business models and partnership models to support the legacy of the programme.

Overall, the demonstrator phase will be used to help evaluate and quantify the benefits relating to all of the demonstrators including Open Data so that they can be incorporated within a business case. This will assess the benefits of sustaining the solution moving forward, expanding the concept across the city, and demonstrating the value to other municipalities.

In particular, the demonstrator phase has a specific work stream that is investigating:-

Legacy

The development of a business case for sustaining and expanding the demonstrators across the city to maximise the legacy benefits for Glasgow, and the investigation of innovative new business models.

Innovation

The opportunity for further innovation building upon the demonstrators developed during the Intelligent Street Lighting project.

Internationalisation

Identifying opportunities to take the learning from Glasgow to help other cities around the world to embrace the future cities market, and (where applicable) provide new opportunities for UK business.



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