Case Study:

Copenhagen City Data Exchange

Type: Website

Organisation(s): Copenhagen Municipality (*Københavns Kommune)*, Capital Region (*Region Hovedstaden)*, Hitachi Consulting

Tags: open data, process, standards, website

Copenhagen's City Data Exchange (CDE) was established as a public-private collaboration for sharing data owned by public authorities and private companies in Copenhagen. The aim was to foster innovation and collaboration through making data more accessible. The website brings together diverse sources of information about the city for SMEs, as well as large, established companies.

The programme was coordinated by the City Solutions Lab. This is a team within the Copenhagen Municipality that works to find data-driven solutions for the city. The team seeks challenge-focused solutions to city problems and collaborates with national and international partners on smart city work.

Whilst CDE was discontinued in 2018 due to a lack of demand, many useful lessons can be drawn from this case study.

Background

Copenhagen Data Exchange (CDE) was launched by the Municipality of Copenhagen and the Capital Region of Denmark. A tender was put out in 2015 for a company to design and host a marketplace for data sharing, which was won by Hitachi Consulting.

CDE was intended primarily to kickstart a new market for selling and purchasing data, and provide a single point of access for data from a range of sources using a single protocol. Not all datasets on CDE were for sale, however – while 25 were sold priced, 134 were published openly.

It was thought that this model could later be scaled up to a national and potentially international level. This approach was pioneering, and was intended to take advantage of the idea that data could be the 'new oil'; a valuable strategic commodity for the 21st century.

CDE also acted as a matchmaker, enabling new partnerships by bringing together organisations that wanted to discuss data-sharing with one another. It also helped raise the profile of Copenhagen globally as a centre of smart city innovation. This encouraged high-profile visits from major international companies, and inspired university students to consider a career working with data.

The chief aims of the programme were to improve the quality of life in the Copenhagen area, foster innovation, boost Copenhagen-based businesses, and help achieve Copenhagen's goal of carbon neutrality by 2025.

Ultimately, CDE was discontinued after the end of the contract with Hitachi. CDE failed to reach the critical mass of datasets and data purchasers needed to make the model

sustainable. There were many reasons why the data marketplace did not work. These provide valuable lessons for future local data projects, including for Greater Manchester.

CDE Evaluation

In 2018, an evaluation report was published, which culminated the work on the CDE. This pulled together responses from 1,000 participants who had interacted with the CDE, identifying problems (see below) and opportunities. The report issued the following recommendations based on lessons learnt from the CDE:

1. Establish solid use cases to demonstrate how traditional companies could profit from the sale or use of data. These cases should be based on a particular opportunity or challenge and encompass both the consumer and supplier perspective, as well as tips on how to avoid pitfalls.
2. Create a regional or national data community. This can help stakeholders to meet and explore opportunities, as well as collaboratively identifying data demand patterns.
3. Establish common standards for data sharing. These should be based on use cases that would illustrate the most effective standards. Data standards should involve guidelines on data presentation and visualisation, methods of data sharing, as well as IT security and privacy issues.

Important considerations

Content and Usage

The CDE platform allowed prospective buyers to: filter through listed datasets to identify those that were relevant to them; view metadata in full; and sample datasets. They could then decide whether or not to make a purchase. The platform also allowed prospective sellers to upload datasets alongside metadata.

The largest publisher by far was Hitachi Consulting (131 datasets), followed by the online bookseller saxo.com (8 datasets). The most common category was ‘housing and buildings’ (61 datasets) followed by ‘infrastructure (60 datasets), whilst the most common update frequency was monthly (128 datasets).

The datasets that were traded on CDE included datasets on the frequency of home break-ins, traffic jams, detailed meteorological data, and residents’ electricity usage. The aim was to sell them to a range of partners, including those that might not otherwise consider purchasing data, such as transport providers and e-commerce retailers. Each customer was able to apply each dataset to multiple analyses, substantially lowering the overall cost where this was possible.

The most popular datasets for buyers were related to human movement patterns, which allowed companies to better understand their prospective customers. These data were collected using a range of sources, including mobile phone tracking, WiFi counting, camera image counting, traffic sensors, ticket purchasing, and visual surveying. Customers of these data included retailers looking to understand where to locate stores or run marketing campaigns, and transport providers hoping to increase efficiency or market share.

Demand

In practice, the CDE mostly facilitated the exchange of data through individually tailored deals, as each data user had very specific needs depending on what they wanted the data for. For instance, whilst many users were interested in human movement data, the data

required varied greatly. For some users, transport mode was most important. Others requested more personal data, such as gender and age, while others wanted externally held data on traffic accidents or events taking place in the city. Joining all of these data points up was a major challenge.

Blockers and challenges

Problems with the data marketplace model

There were many reasons why companies were reluctant to participate in the data marketplace, mostly relating to a lack of incentives. The specific reasons highlighted in the CDE evaluation report are as follows:

- **Concerns about data ethics**. This goes beyond keeping within legislative restrictions, as many companies were also worried about negative media attention and reputational damage.
- **Concerns about competitors accessing commercially sensitive data**. Whilst it was possible to block competitors from buying data directly, it was harder to prevent third parties from buying and reselling it.
- **A lack of technical skills, particularly among SMEs**. This made it hard for them to transform raw data into useful information. Without clear use cases, there was a reluctance to invest in data scientists and tools, creating a barrier to market entry.
- **Limited budget**. It was difficult to persuade smaller companies that were not specialised in data, such as taxi companies or online booksellers, to invest in an activity they considered to be interesting but non-essential.
- **Arrangement of dataset sales**. As dataset sales were usually arranged on a case-by-case basis through negotiation on parameters between buyers and sellers, the marketplace platform itself became obsolete.

Data communities and collaboratives

The CDE evaluation report highlighted which aspects of the CDE could be built on in the future. Instead of taking a marketplace approach, a solution that is increasingly gaining traction, which reflects part of CDEs' remit, is the data collaborative.

This is a forum that focuses on linking up data sellers and data buyers rather than directly hosting transactions. These also make use of the benefits of partnerships between public and private sectors to co-create use cases of data-driven municipal solutions.

Many people who were interviewed for the evaluation report saw a data collaboration that would provide tailored support to partner organisations as a potential solution to a lack of internal skills and tools to handle data.

Data collaboratives can take numerous different forms, and are often focussed on specific areas. For example, the Californian Data Collaborative of water utilities aims to form a basis for improved infrastructure planning and demand management across California. The broad types set out by Data Collaboratives, the organisation that represents these programmes, are:

- Prizes and challenges
- Data cooperatives or pooling
- Research partnerships
- Intelligence Products

- APIs (Application Programming Interfaces)
- Trusted intermediaries

What can Greater Manchester take from this?

- There is an appetite for better matching of supply and demand for local data, as reflected in the breadth of interest CDE attracted. However, there are major issues with the marketplace model that must first be resolved. These involve both data ethics and sensitivity, and the level of demand from users.
- It is not possible to transform data into a standardised product that can be resold to multiple customers. The needs of data users are highly specialised and often unique. It is therefore essential to understand these needs properly when developing data products. Any data marketplace needs to be agile and flexible enough to reflect this.
- There is a high level of demand for data on human movement patterns among prospective data users. However, there are many challenges around these data that need to be addressed, including privacy concerns and finding ways to link up large numbers of data sources.
- It is important to confront the concerns of potential smaller scale data users in relation to the barriers to entry in this market. This applies even to open data, as making use of this resource demands time commitment and an investment in data skills. However, these concerns are likely to be even greater when charging a fee for high-value datasets.
- Having concrete use cases to hand that demonstrate the practical benefits of publishing or using data is essential to persuade prospective participants to get involved in a data collaborative. Use cases also help define workable standards for data quality and format by linking them to the identified needs of data users.
- There are many different models for data collaboratives that are distinct to conventional open data portals, and it would be beneficial for Greater Manchester to explore these as well.

Find out more:

http://datalandscape.eu/sites/default/files/report/Story_1_New_format.pdf

https://cphsolutionslab.dk/content/2-what-we-do/3-data-platforms/3-city-data-exchange/1-learnings-from-the-city-data-exchange-project/city-data-exchange-cde-lessons-learned-from-a-public-private-data-collaboration.pdf

https://cphsolutionslab.dk/en/news/city-data-exchange