

Urban Big Data Centre

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E · S · R · C
ECONOMIC
& SOCIAL
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University
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UBDC Partners

Funded by ESRC Big Data Network Phase 2



Festival of Social Science

- Event is part of the ESRC Festival of Social Science.
- There are 200+ events happening across the UK this week (a full schedule is in your delegate packs).
- We encourage attendees to tweet throughout the event using #UBDC4LA & #ESRCfestival.

Vision

Innovations for sustainable and socially-just cities

Mission: Promote innovative methods and complex urban data to address social, behavioural and environmental challenges facing cities:

- **Strategic Themes** - dynamic resource management; social inclusion; lifelong learning; economic and business innovations; citizen engagement and citizen science, planning and policy reform
- **Data Activities** - Open data, secure and confidential data, real-time analytics, data capture and linkage, synthetic data generation
- **Multiple Urban Sectors:** transport, housing, education, economic development, environment, energy – **particularly their connections**

Big Data

A wide spectrum of naturally-occurring data:

Generated through transactional, operational, planning and social activities not all of which were specifically designed for research or the linkage of such data to purposefully designed data

Complexities associated with which require special considerations:

- Technological
- Methodological
- Theoretical/epistemological
- Political economy

Big Data in the Urban Context

Urban Big Data	Examples
Sensor systems	Environmental, water, transportation, building management sensor systems; connected systems; Internet of Things
User-Generated Content	Participatory sensing systems, citizen science projects, social media, web use, GPS, online social networks and other socially-generated data
Administrative (governmental) Data	Open administrative data on transactions, taxes and revenue, payments and registrations; confidential person-level microdata
Private Sector Data	Customer transactions data from store cards and business records; fleet management systems; usage data from utilities and financial institutions; product purchases and terms of service agreements
Arts and Humanities Data	Repositories of text, images, sound recordings, linguistic data, film, art and material culture, and digital objects, and other media
Hybrid Data Sources and Synthetic Data	Linked data including survey-sensor, census-administrative records



Thakuriah, P., N. Tilahun and M. Zellner (forthcoming). *Big Data and Urban Informatics: Innovations and Challenges to Urban Planning and Knowledge Discovery*. In edited volume *Seeing Cities through Big Data: Research Methods and Applications in Urban Informatics*, to be published by Springer.

Many elements to juggle!

- Robust infrastructure
- Sustainable environment
- Health and wellbeing
- Social justice
- Diversity
- Business innovation
- Citizen engagement
- Competitiveness

Challenges

- Timeline/turn-around time for planning or policy response
- Predetermined choices and interests of key stakeholders
- Limited opportunity for meaningful involvement by advocacy groups and citizens
- Lack of high-quality information to operate, plan, or evaluate urban strategies
 - Fragmented and siloed information
 - Lack of timely, granular information
 - Lack of understanding of value
 - Skills
 - Software, hardware, other data issues

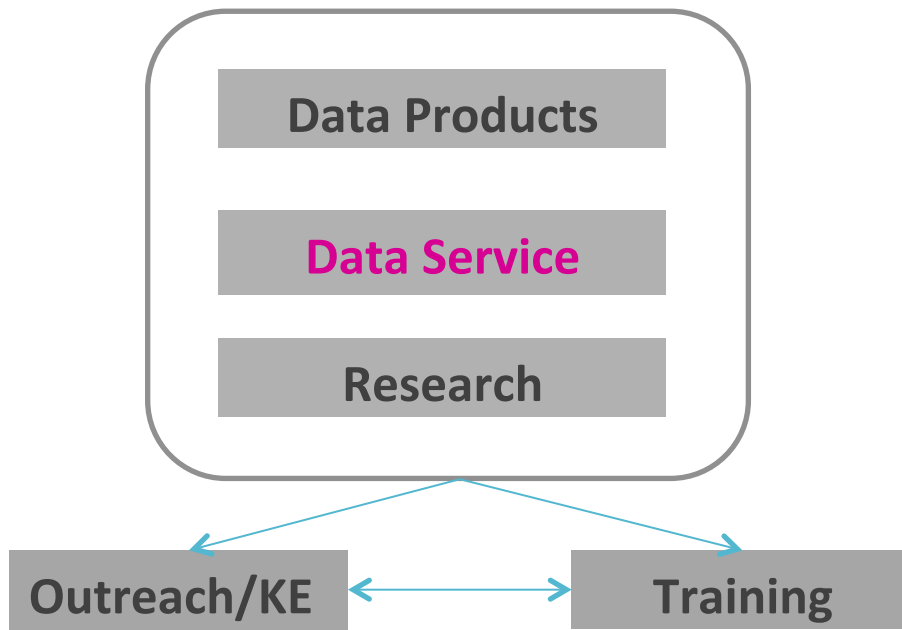
Big Data and Urban Planning & City Management

- **Urban operations and management** – e.g., transport operations and traffic flow management, energy management and optimisation
- **Urban planning** – e.g., large-scale: urban land-use planning, mega-infrastructure planning; small-scale: site design, brownfield planning
- **Urban policy analysis and evaluation** – impact of proposed high-speed rail construction, increase in cigarette tax, crime prevention strategies
- **Citizen engagement/civic participation** – involvement in plan-making, design and idea-generation; crowdsourcing travel and other information, Volunteered Geographic Information
- **Knowledge discovery of patterns and trends** – e.g., understanding emerging issues, behaviours, public mood, critical concerns

What we do

Run a national data service to facilitate urban research

UBDC Portfolio



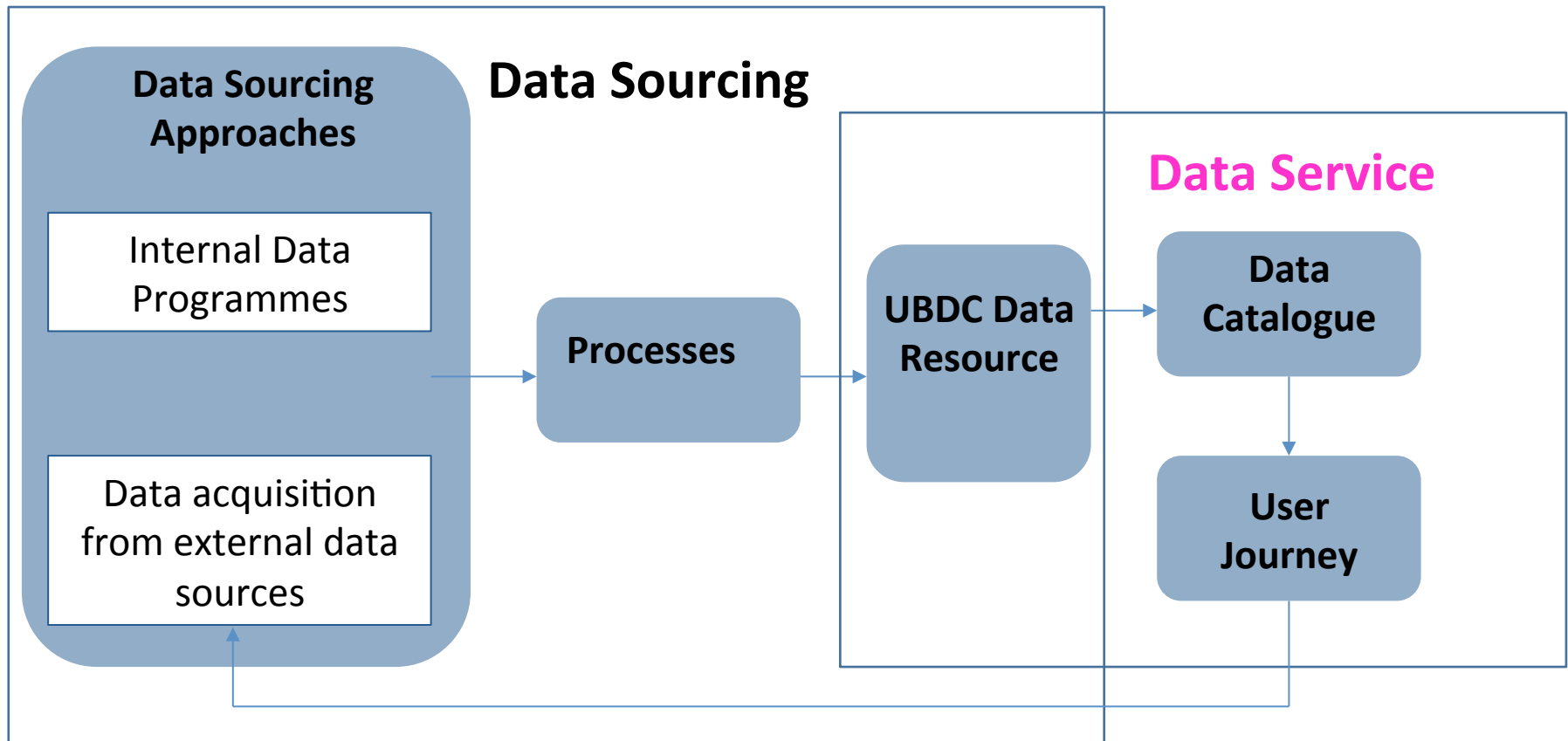
Disciplines – Urban Social Science, Data Science and Engineering

- Urban studies, planning & policy
- Statistics
- Economics
- Computer science
- Education
- Geography
- Mathematics
- Civil engineering

Data Service

- **Data Service Infrastructure**
 - **IT environment** – cluster, other hardware, software, web portal and other user access such as virtual machines, geoserver, information retrieval and processing tools, data privacy and security
 - **Data collections, sourcing and acquisitions** – discovering, technical and legal issues
 - **User access and use** - resource discovery mechanisms, metadata, data catalogue, user journey, user guide, initial enquiries, proposal development, technical support for data management
- **Governance** - Research Approvals Committee & Data Approvals Committee
- **Training and capacity-building**

Data Sourcing – A research-led methodologically rigorous strategy to generate and acquire data



* Data Programmes: iMCD, HMD, SOMEWHAT, SUDS. ** Data acquisition – Internal: Data acquired from UBDC stakeholders including Glasgow City Council and British Geological Survey. *** Data acquisition – External: Data acquired as a part of approved external research. @Processes: Processes adhering to Operational Objectives and Operational Principles to deposit data in UBDC Data Resource

Using UBDC to Enhance Your Services

- We offer a free-at-point-of-use data service to researchers of all kinds to investigate urban issues using big data.
- We do not offer funding for research, so proposals must be funded via other avenues.
- Research projects that work with our data services are scrutinised and approved by an independent panel of experts to ensure that:
 - public benefit and societal impact will be achieved;
 - the researchers are competent;
 - the work proposed is in scope and possible (timing and resource allocation);
 - there is legal/ethical compliance.

UBDC Calls for Proposals: An Invitation

- From 2016, we will be issuing regular Calls for Proposals based around topics, themes or specific data owners or datasets/collections.
- If you have data which can be used to address any planning or policy question, we would like to invite you to collaborate with us in developing Calls for Proposals to attract researchers
- You may identify and suggest themes or issues that you wish to collaborate with researchers on.
- You may also identify particular data collections in your organisation that could support research that you would find useful.
- We can ensure researcher access to your data is legally and ethically compliant, and secure with regard to the DPA and disclosiveness.

Benefits of Approach

- Work with you to derive **value out of data that you have**.
- Properly scoped and planned research can give you a strong evidence-base to solve problems faced by your organisation.
- The process will involve ensuring your data is properly curated, cleaned and managed going forward.
- Involvement of your own staff can result in internal capacity building around data management and curation.
- We help to **broker relationships** between you and researchers with synergistic interests.
- Highlight the innovativeness of your data to peer organisations.

New MSc in Urban Transport! Check out: <http://www.gla.ac.uk/postgraduate/taught/urbantransport/>



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An ESRC Data
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