The impact of digital transformation on societal priorities

Urban Data Platforms as critical infrastructure in cities and regions

January 12, 2022 | Dr Marcel van Oosterhout
Urban Data is everywhere ...

- Waste collection
- Position and energy use of electric buses
- Underground infrastructure
- Parking sensors
- Traffic & crowd measurement
- Personal (social media) data
However, the existing urban data landscape has many challenges....

Closed data
Silo applications
Not re-usable

Lack of
data quality

Lock-in

Fragmentation of initiatives

Challenging Governance
(Multiple stakeholders & owners)

Unused Potential for innovation
(quadruple helix)
Urban Data & Open Urban Data Platforms (UDP)

ORGANISATIONAL VIEW

City Ecosystem of Data Providers, Data Users and Services

COMPANIES

START-UPS & APP DEVELOPERS

SEMI-PUBLIC ORGANISATIONS

CITIZENS

NGOs

CONSUMERS / USERS

GOVERNMENT(S)

Open urban data platform

ARCHITECTURAL VIEW

AI and data-driven solutions

Digital Twin / Dashboard

Central Intelligence

Open urban data platform

Connectivity

Data

Sensors

In-field devices IoT sensors

Citizens as Sensors
Towards a Digital Twin of the City to support decision making

Descriptive analytics
Insights - logic

Digital Twin
Past

Decision Cycle
Sense
Interpret & Evaluate
Respond
Decide
Reflect & Learn

Prescriptive interventions
(using AI)

Visualization
3D model

AI / predict

store data

capture
real-time sensor data

respondering
(autonomous) actions

Digital Twin
Future

Open Urban Data Platform

Current Physical World

Fixed (infrastructure) Objects

Moving Objects

Environmental Objects
State of development in Europe (per 2020)

Representative sample of 80 cities in Europe, with in total 105 respondents. The study was executed in the period November 6, 2019, until January 10, 2020. 85 percent of the respondents were partner in one of the EU SCC projects, funded by the European Commission.
What Core Interaction is currently facilitated on the platform?

Data available to users in Open Data Platform
APIs for platform services
Connect data users, app providers and data sources
Visualize data in a 3D digital twin of the city
Software Development Toolkit (SDKs) for App development
Connect buyers and sellers of data and Apps with catalogue
Allow trade on the platform through an app store
Price setting market mechanisms
Selling Apps with revenue share

Frequency Distribution

- Currently supported by the platform
- Envisioned to be supported by the platform
Trust is the core success driver of an UDP ecosystem Capabilities – Collaboration – and Governance breed Trust

What are the key accelerators and inhibitors of UDPs?

Trust among the involved partners
-0.84

Triple helix collaboration
-0.99

Open data standards & Protocols
-0.86

Subsidies, Grants
-1.03

Citizens’ actions and involvement
-1.05

Private sector drive
-1.24

Business Case
0.00

Political commitment / sponsorship
-0.55

Cultural and social issues
-0.46

Digital literacy of end users
-0.84

Data ethics and societal concerns
-0.86

Privacy legislation
-0.99

Procurement legislation
-1.03

Cyber security risks
-1.05

Legislation
neutral

Contractual complexities
-1.24

Source: 2019 study by EUR on UDP among 80 cities in Europe
### Digital literacy, ethics and legislation are among the key restricting factors

#### What are the key accelerators and inhibitors of UDPs?

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<th>Factor</th>
<th>Mean Overall</th>
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<td>0.73</td>
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<tr>
<td>Triple helix collaboration</td>
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<tr>
<td>Open data standards &amp; Protocols</td>
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The UDP is part of a broader urban data ecosystem.
Key take-aways & recommendations

1) Data is a key strategic resource for cities, Open Urban Data Platforms are vital infrastructure for cities:
   • support cycle of decision making
   • creates platform for innovation
   • enables scaling of smart city Initiatives and deployment of AI-based services

2) Development of UDPs is still in early stage in Europe, there is no one size fits all development approach

3) Governance, Capabilities, and Triple Helix collaboration & engagement build the **Trust** needed for UDPs to work

4) Data governance (quality management, open data standards, data ownership, data security) is crucial capability

5) Use agile mind set and continuous improvement approach: Think big, start small and learn fast! *(licence to fail!)*

6) Existing companies need to rethink their business model in the context of urban data platforms

7) Urban data platforms are part of an ecosystem (of platforms) – that creates many opportunities for new business models
Passion provides purpose, but data drives decisions

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