As our ‘habitat’ is coming to life through outfitting our city with intelligent sensors, the question of who owns all this data is highly relevant. Different models of data ownership are emerging: tech companies with their centralized platforms still proliferate in the U.S., but decentralized structures are emerging in Europe, and centralized government-led initiatives are built in China.

**Our observations**

- In the U.S., cities are increasingly taking part in public private partnerships (PPP’s) with tech companies to tackle urban challenges or improve government services (e.g. New York, Columbus, Kansas City). The rise of PPP’s is partly caused by the fact that the fiscal health of many local governments has been declining for years, pushing municipalities towards working with tech companies to tackle urban problems, but is also rooted in America’s tradition of higher trust in private companies. Google’s project in Toronto is another case in point: the American company was reportedly surprised by the privacy backlash that is currently holding back the project.

- In continental Europe, where suspicion of (tech) companies is higher (and trust in the capacity of the state is higher), cities are more inclined to follow stakeholder models and are increasingly adopting open data platforms. Barcelona is a case in point: there, digital policy is seeking to open digital platforms to greater citizen participation. Worried about Barcelona’s knowledge being handed to tech companies, the council now promotes technological sovereignty.

- In China, cities operate within a top-down model led by the central government. The Chinese government is trying to set up a nationwide information-sharing platform for e-government and ‘smart city systems’, sharing data among its cities. Xi Jinping recently said that “implementing a Big Data strategy to better serve the country’s development and improve people’s lives should be accelerated.” Cities like Singapore and Songdo, South Korea also follow this model: these are cities where data that is collected in the city is managed centrally by the local government.

- While open data platforms are also popping up in the U.S. (e.g. New York, Boston) and in China (which in 2016 rose from number 93 to number 39 on the Global Open Data Index), these platforms are more prominent in Europe, moving beyond presenting data to the public. In Europe, cities are promoting public digital infrastructures based on open source software with open standards, enabling third parties to develop applications. For instance, under an EU effort called CitySDK, eight cities (including Amsterdam, Barcelona, and Rome) have created an open source API focused on mobility data and creating location-based services.
Connecting the dots

The home, street, city and skyscape are the four layers of our ‘Smart Habitat’. For citywide data-driven systems on the layer of the city, the question of data ownership is highly relevant: who decides under what conditions data can be used to develop applications? Across the world, governments have different mindsets in thinking about data ownership, which has different implications for the future of their cities. In the U.S., tech companies compete for public-private partnerships to build citywide systems on their platforms. As each company has its own platform, municipalities often end up with vendor lock-in: the company behind the platform owns the data, and municipalities cannot freely use the data (i.e. to develop applications with third parties). Increasingly, the American model is encountering privacy concerns (e.g. Google in Toronto). Such (typically American) competition for PPP’s has become the dominant narrative about ‘smart cities’, but elsewhere in the world different models are emerging.

In Europe, urban governance has increasingly started following a stakeholder model in which governments (local, national, European) work together with citizens and industry. While many European cities initially followed the American model, European governments have dealt with the backlash against tech companies in a different way. The GDPR, which goes into effect today, is a prime example of Europe protecting citizens against the power of tech companies. Data collected in urban environments is increasingly considered as a public resource. As such, European cities are now frequently adopting open data models: data that is collected in the city is made available on a publicly accessible platform (e.g. Amsterdam, Barcelona, Paris). However, the problem of open data is that certain data which might lead to useful applications may not be collected since opening such datasets to the public raises privacy concerns (e.g. car locations, camera’s).

In China, smart city projects have been more ambitious because of the top-down structure of the central government (e.g. carbon trading, social credit systems). Another notable difference between Chinese cities and Western cities is that Chinese local governments perform far more administrative functions. Therefore, the push from the local government to use new technology to tackle persistent problems (e.g. traffic jams, environmental pollution) is higher in China, whereas Western municipalities focus more on improving basic government services (and ‘smart city’ remains a buzzword). However, China is struggling with integrating different platforms into a comprehensive database as it tries to aggregate all available data from its cities into a common platform. Around the world, different mindsets of governments mean that cities encounter different obstacles towards finding successful applications for persistent urban problems. Vendor lock-in of the American model means that local governments are increasingly hesitant to cooperate with tech companies. Privacy concerns and open data structures mean that the range of potential applications in the European model is limited. The top-down model of China means that the lack of a comprehensive database prevents the development of potential applications. These differences imply that every region has to work around its own barriers to development and thus awaits a different enabling factor to boost ‘smart city’ projects.

Implications

• As closed architectures restrict the ability of cities to access the data that is trapped inside of the infrastructure they have purchased, governments are increasingly wary of such partnerships. Therefore, the near-term future looks bleak for tech companies and their smart city projects in the U.S. Google’s Toronto project is a case in point. However, if an acceptable (legal) framework for data ownership emerges (which could be more lenient than European norms), smart city projects could gain a significant boost across the U.S.

• If China manages to successfully connect its cities’ datasets in a common platform, more radical applications could emerge (e.g. mobility, security, pollution).

• The European model could focus on creating a decentralized architecture in which cities share data and invite developers to build applications on top of this architecture.

• It is likely that countries will adopt national data strategies for their cities (including legal frameworks for data ownership), similar to China’s Five Year Plan, in order to harness the benefits from outfitting cities with intelligent sensors.