

SynchroniCity builds smart city IoT data marketplace

By Mike Hibberd, Independent Analyst & Consultant

SynchroniCity, a large, international internet of things (IoT) pilot for smart cities, and its technology partner Digital Catapult, a UK government innovation agency, are using TM Forum Open APIs to create a marketplace enabling the exchange and trade of a broad array of city-generated IoT data among a diverse group of stakeholders for deployment across multiple cities. The first one is now live in the Spanish city of Santander, with launches planned for 2019 in Manchester, Helsinki, Carouge, Porto and other cities.

The smart city concept is rich in both social and commercial potential. Almost half the world's population are now urban dwellers – and still cities continue to grow. Forecasts predict that by 2050 an area the size of Australia will have become urbanized.

Cities need to get smarter to sustain and serve their growing populations. Fortunately, they have the capacity to be far quicker and more agile than nations, not least in the adoption of new technologies and economic and collaboration models.

Making cities smarter will depend on the successful extraction and exploitation of the vast quantities of data cities generate, turning cities into giant, inhabited platform-based ecosystems.

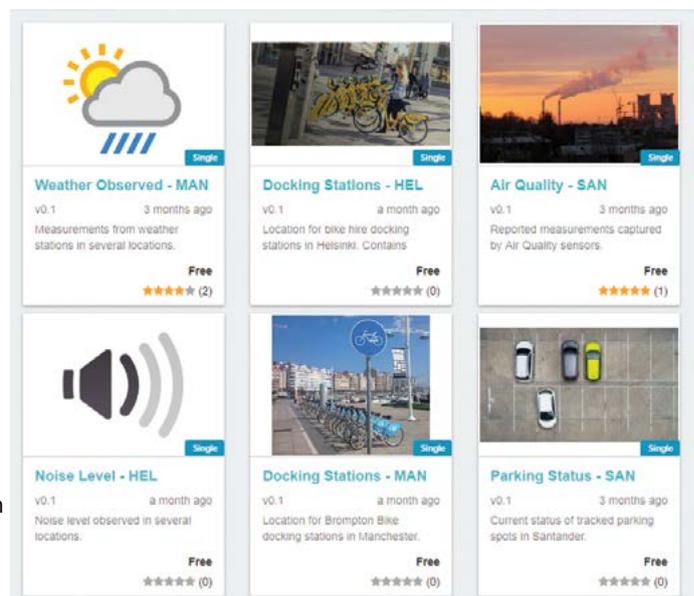
Leading the way

SynchroniCity is an ambitious project emerging from the European smart city sector. It was conceived to create a global IoT services market in which cities, businesses and other stakeholders can collaborate on the development of new digital services designed to improve the lives of citizens and stimulate local economies.

The project takes the form of a large-scale IoT pilot which is being rolled out across several partner cities. At its heart is the conviction that the success of smart cities across the world hinges on the use of agile, open standards.

SynchroniCity aims to build a reference architecture for smart city implementation which can be easily replicated from one city to the next. In this way, cities and organizations across the world will be able to share learning, harmonize efforts and maximize the impact of this bold movement to bring smart cities to life.

Launched in 2017, the project so far has attracted more than 35 partner cities and organizations. Funding is led by the European Commission, through the Horizon 2020 Programme, with support from the Swiss Confederation, and the Republics of Mexico and South Korea. Participating cities include Antwerp, Carouge, Eindhoven, Helsinki, Manchester, Milan, Santander, Porto, Leon (Mexico), and the South Korean city of Seongnam. The screen shot below shows the SynchroniCity portal:



Building a marketplace

The SynchroniCity IoT data marketplace is a crucial component of the project's framework, allowing participating data providers to expose, exchange and trade their IoT data. It underpinned by TM Forum APIs (see below).

Digital Catapult is leading development of the marketplace. The agency undertook a rigorous analysis of available platforms on which the marketplace might be built and interviewed key personnel within partner cities and organizations in order to understand the requirements the marketplace needed to meet.

"Our analysis revealed that there are a variety of factors which contribute to the successful adoption of an IoT data marketplace by a broader ecosystem," says Dr. Andrea Gaglione, Senior Technologist, Digital Catapult. "However, a number of characteristics emerged clearly as essentials, not all of which were provided by the existing platforms we investigated."

These core requirements were as follows:

- Data catalog with lookup functions
- Access control
- Tools to create suitable agreements
- Seamless monetization for transactions
- The ability to foster fair behavior among the users in adherence to service level agreements (SLAs) and licence agreements (building positive and trusting relationships among them)
- Tools to assess the quality and trustworthiness of IoT data and its providers

Digital Catapult decided to develop a new IoT data marketplace, selecting the FIWARE/TM Forum-developed Business API Ecosystem as its foundation.

Easily adaptable APIs

"The Business API Ecosystem was chosen because it was a good match for the requirements we had gathered other than being open source," Gaglione explains. "It provided the perfect base, allowing us to easily adapt and extend certain APIs to develop a marketplace tailored to IoT data."

The greatest amount of customization was required for the Catalog Management API, Gaglione explains, in particular the licence and SLA elements which data providers would use to regulate the supply and exchange of their data.

"The original data licence was too generic," he says. "Several of the cities and IoT businesses required more extensive features to be specified."

In fact, as data providers they would need to be able to specify standard and custom licences. They required exclusivity attributes which would allow some parties to access data but not others, or to specify countries from which data would be accessible. Students might be given

access to data for free, for example, while businesses would be charged.

The SLA component was also extended to enable the data providers to specify three basic metrics:

- Update rate (number of data updates in a given time frame)
- Response time (the interval between request for data and response)
- Delay in a subscription-based data access

The adapted Catalog Management API which forms part of the SynchroniCity IoT data marketplace is roughly 20% customized, Gaglione explains.

A security layer to control access to data was added along with a trust layer. In fact, another key innovation in the creation of the marketplace, although not related specifically to the APIs, was the development of a "transparency and accountability service" which allows for the storage and tracking of data licence agreements and SLAs on a blockchain network to settle potential disputes in the future. The service helps build trust among the marketplace users and fosters a fair behavior in adherence to data licence agreements and SLAs.

A "feedback and reputation" component which allows data consumers to rate data and data providers, further enhances the capability of the marketplace to track the effectiveness of the marketplace and the data it disseminates.

Taking the marketplace to market

The SynchroniCity IoT data marketplace is currently operational in the Spanish city of Santander, with deployment imminent in Manchester, Helsinki, Carouge, Porto, and other partner cities. The winning entrants from a 2018 Open Call run by SynchroniCity will begin deploying their pilot applications based on the project framework in February 2019.

If you're interested in learning more about TM Forum's Smart City APIs or the Smart City Project, please contact Joann O'Brien via jobrien@tmforum.org

For more information visit:

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