CHORDANT™

AGILE IoT FOR COLLABORATION & SCALE

Data marketplaces let organisations capitalise on new sources of value by managing and trading IoT data in a controlled way

Ubiquitous connectivity and affordable, wireless-enabled sensors and devices are feeding a wave of new Internet of Things (IoT) systems. The goal of many of these systems is to improve operating efficiencies.

Meanwhile, 5G, machine learning (ML), and artificial intelligence (AI) technologies are opening the floodgates for massive machine-type communications. These developments will massively increase the scope and volume of IoT data and spawn numerous IoT applications.

Vodafone's annual "Barometer of the IoT" business survey points to ever stronger and mission-critical adoption intentions. We see this in articles about smart street lighting, just-in-time waste collection, fleet telematics, and remote asset management to list but a few.

In 2017, Cisco's "Connected Futures" research indicated that only a quarter of IoT initiatives were successful. While opportunities for IoT-based solutions abound, there seems to be a challenge in scaling up pilots and delivering long-term value. Which begs the question – what is necessary to push siloed IoT systems to the next level of cooperation, scale, and synergy?

Tackling the Long-Term IoT Challenge

Many IoT applications are built around an initial use case or to exploit a specific data set. If an organisation subsequently wants to build on its first solution, it will incur additional design and integration costs. It may also have to resolve cross line-of-business organisational issues. All told, this can become commercially insurmountable for many IoT initiatives.

Instead of working up from a successful first application, what happens if organisations tackle the long-term IoT challenge from a different angle? Let's say they start off by planning to support many IoT applications. These would use data from a wide variety of sources using different communication types. Most likely, these

IoT-based solutions are now starting to deliver tangible benefits to businesses and communities…

organisations will have to work with several suppliers and even some third-party service delivery partners. This is not unrealistic in the context of a smart city, a manufacturing facility or a multi-modal transport system. Even a farm, which may appear to be a simpler ecosystem, contains multiple, and preferably joined-up, IoT applications such as accurate planting, the correct application of fertilizers, and traceable distribution of farm produce.

The multi-application perspective means that large-scale IoT solutions are a matter of matching data suppliers (e.g. sensors, connected devices and other data sources) to data consumers (e.g. applications, data analysts and service providers). This line of thinking opens up new areas of innovation and business potential in the IoT market. Its success relies on any-to-any interactions, with the marketplace concept offering an effective brokerage model for the exchange of IoT data between suppliers and consumers.
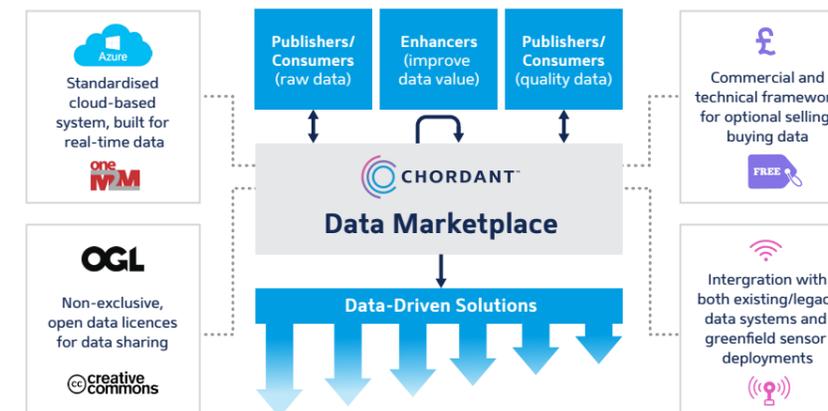

Figure 1: Data marketplace business model and operational architecture

IoT Data Marketplace Vision

In conceptual terms, a data marketplace brings data suppliers and data consumers together. It solves a technical problem by abstracting the complexity of sourcing IoT data from multiple different sources, data types and connectivity services to supply them in user and developer friendly formats. As a result, users don't have to lock into a single use case or technology. They can explore a wider range of opportunities, creating and managing heterogenous data-driven solutions.

Marketplaces serve many different types of user. An IoT data marketplace is no different. Some users may choose to consume raw data and build their own IoT applications.

A second category, data enhancers, adds value from manipulating raw data. These users may package clean data, create metadata variants, or make data more discoverable for others to use.

A third type of user might focus on creating value through advanced data analytics. Their role is to create insights and feed value-added data back into the marketplace. A viable marketplace needs additional mechanisms to enforce commercial and legal rules. These provide a foundation of trust for both data suppliers and data consumers. For example, data consumers require a reliable supply of data (e.g. payment mechanisms and quality of service commitments) to build business-critical applications and services. Data suppliers, on the other hand, need tools to charge for their data or apply usage limitations (e.g. data licensing terms for transferability or re-use of data).

IoT Data Marketplaces in Practice

Early in 2018, Chordant™ an InterDigital business, launched the oneTRANSPORT™ Data Marketplace for smart cities and intelligent transport applications. The marketplace builds on a field trial in the United Kingdom, led by Chordant. The 2-year trial proved that different public and private sector organisations could exchange real-time IoT data through a central marketplace 'hub' and create scalable IoT solutions. Several flexible IoT solutions, addressing a variety of use cases, were built over the course of the trial. They demonstrated the mechanisms necessary for the sustained, equitable exchange and exploitation of IoT data between different organisations.

Public sector Transport Authorities in Buckinghamshire, Hertfordshire, Northamptonshire, and Oxfordshire, together with two private sector IoT sensor companies, took the data supplier role. They published different real-time data sets derived from various transport-related sensor networks.

There were several data consumer groups. Academic and private sector specialists applied analytical approaches to derive journey planning insights associated with Park-and-Ride services in Oxford (city scenario). Regional transport agencies and facilities managers successfully reduced road congestion and parking inefficiencies for travellers to the Formula 1 race weekend at Silverstone Circuit (large-scale, rural scenario) and in Watford town centre (medium-scale, urban scenario).

Since commercial launch, the growing community of users of oneTRANSPORT Data Marketplace continues to innovate with multiple sources of data and explore new monetization schemes for IoT data. Transport infrastructure and service companies are exploring how to improve road maintenance, waste collection and utility servicing with shared real-time data. Transport operators are examining options for the controlled licensing of operational data sets that other organisations are better placed to exploit commercially. The marketplace is also attracting increasing interest from city and regional authorities keen to embrace connected and autonomous vehicle developments and the new service opportunities that are emerging.

Within the data marketplace, Chordant plays a neutral role. The oneTRANSPORT Data Marketplace service operates as a data broker, providing the tools that data suppliers and consumers need to interact technically and commercially. Chordant's use of the oneM2M™ standard for horizontal IoT platforms provides users with standardised Application Programming Interface (APIs) and the confidence that they are building on an architecture that does not lock them into a single vendor offering.

"IoT-based solutions are now starting to deliver tangible benefits to businesses and communities," says Ash Wheeler, Senior Director, Chordant, "but first-generation implementations are often too constrained. Agile businesses need agile systems to capitalise on evolving requirements and new service opportunities. A collaborative approach, supported by services that enable the controlled sharing of data across systems and organisational boundaries, is unlocking a new breed of IoT implementations that can adapt and scale for long-term value creation."

To find out more about IoT data marketplaces, contact Ash Wheeler

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