

OPEN HOUSE

The Australian Smart Buildings Data Clearing House offers a single-location, open platform for accessing valuable data resources, writes Danny Chan.

The digital transformation of the built environment has been gathering pace. This is evident in the adoption of Internet of Things (IoT) solutions, upgraded IT infrastructure, and IoT-enabled building hardware systems.

However, developments have been less than obvious in relation to how data is being used, linked and shared, so that value can be derived through this digital transformation.

The Australian Smart Buildings Data Clearing House (DCH) has been established with the aim of extracting value from data to share nationally across industry. The emphasis is on the use of data-driven approaches for providing flexible HVAC loads in support of onsite renewables.



IN ESSENCE

At its core, the DCH is a cloud-based building data management and application enablement platform. As a single location for accessing a wide range of energy and building data, it aims to increase the quality and value of data sets. The goal is to empower Australian businesses to develop new data analytics services. It also connects IoT systems from buildings, and supports complex data analytics.

“The DCH is intended to be an open data platform to enable building owners, facilities managers and property owners to bring data from a variety of sources to gain value-add on that data,” says Akram Hameed, a senior software engineer at Data 61 (a CSIRO subsidiary).

Hameed recently joined CSIRO senior research scientist, Dr Josh Wall, M.AIRAH, to deliver a webinar at the Big Data and Analytics Virtual Forum presented by AIRAH.

BENEFITS OF LINKED DATA

The session titled “i-Hub Smart Buildings Data Clearing House for supporting smart building applications” provided an overview of the DCH and its benefits to industry, including those of gaining access to linked data.

Hameed says that linked data provides an easy method of publishing and linking data coming from diverse data sources, which can be interlinked and shared.



“What we’re trying to do with the DCH is to create linked machine-readable data to enable us to ask questions of our data in a way that is easy for humans to understand and makes the computer do all of the work for finding the relationships,” Hameed says.

Wall says the DCH aims to build a semantic data model that brings in the best concepts from various sources. These include standards, schemas and ontologies from Australia and elsewhere.

As part of the BACnet Semantic Interoperability (SI) Working Group, the DCH is looking into the development of an ASHRAE Standard 223P. The Standard 223P will provide a dictionary of semantic tags – such as those used with articles of news websites – for descriptive tagging of building data, including building automation and control data, along with associated systems.

Says Wall: “We’re looking very closely at that, and borrowing a lot of the modelling and semantics to build into the DCH.”

Wall says the strength of the semantic data model lies in its ability to link across domains or sub-domains into other areas through the use of tags.

He illustrates the versatility of a Virtual Building Information System (VBIS) tag that links across into other databases or knowledge bases around building assets, design time documentation, BIM models and CAD drawings.

“It gives us a really powerful search feature to discover that type of information,” Wall says, “as well as the operational data in buildings.”

SMART BUILDING APPS

The DCH aims to bring a whole range of smart applications or services to the Australian industry. This includes releasing reference applications that will be available to end-users.

The two types of DCH reference apps in development are “On-Platform” and “Measurement and Verification” (M&V).

The On-Platform variety consists of a library of apps or functions that are running on the DCH platform itself. End-users, service providers and app developers can pull these into their own data workflow or pipeline, and utilise the functions that are already there. These are pre-built and generic enough to configure for end-users’ particular applications.

The M&V app is used to assess the energy impact for smart building interventions relating to energy efficiency.

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“It will be freely available,” Wall says. “And it will be implemented following a lot of the international standards, and should be highly configurable so that you could pull in your own data, apply an M&V to it, and have a look at the energy impact of your particular intervention, whether that’s an equipment upgrade, implementation of a new solution or smart controls.”

Some other apps in the pipeline are test implementing the open ADR; demand-response messaging framework; NABERS calculators

(to get NABERS estimates based on data); and ASHRAE comfort models (temperature bands to show comfortable operating conditions).

DATA PRIVACY

Hameed says the security and privacy of data that is shared with the DCH is sacrosanct.

“Any data that is put into the DCH,” he says, “is obviously still the property of the person who generated that data.”

DCH is a multi-tenanted platform – meaning multiple individuals are using the same software. Users will be able to choose whether they wish to share their data.

“You can also access data that has been shared to you by others,” he says. “For example, Bureau of Meteorology data or utility data that may not be internal to your building.”

The DCH has been enforcing authorisation permissions over access to data, and will continue to do so.

“That’s being done using our common information model,” Hameed says, “and is essentially a role-based authorisation scheme.” ■

An i-Hub project

The Australian Smart Buildings Data Clearing House is one of the projects forming part of the Innovation Hub for Affordable Heating and Cooling (i-Hub).

The i-Hub is an initiative led by AIRAH in conjunction with the CSIRO, Queensland University of Technology (QUT), the University of Melbourne; and the University of Wollongong, and supported by the Australian Renewable Energy Agency (ARENA).

