Lesson Learnt Report

CSIRO Senaps data platform demonstration and development

DCH1

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CSIRO

About i-Hub

The Innovation Hub for Affordable Heating and Cooling (i-Hub) is an initiative led by the Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) in conjunction with CSIRO, Queensland University of Technology (QUT), the University of Melbourne and the University of Wollongong and supported by Australian Renewable Energy Agency (ARENA) to facilitate the heating, ventilation, air conditioning and refrigeration (HVAC&R) industry's transition to a low emissions future, stimulate jobs growth, and showcase HVAC&R innovation in buildings.

The objective of i-Hub is to support the broader HVAC&R industry with knowledge dissemination, skills-development and capacity-building. By facilitating a collaborative approach to innovation, i-Hub brings together leading universities, researchers, consultants, building owners and equipment manufacturers to create a connected research and development community in Australia.

This Project received funding from ARENA as part of ARENA's Advancing Renewables Program.
The views expressed herein are not necessarily the views of the Australian Government, and the Australian Government does not accept responsibility for any information or advice contained herein.

Primary Project Partner

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i-Hub Lessons Learnt Report

Guidance notes for completion of the Lessons Learnt Report:

- This report is intended to be made public.
- Please use plain English, minimise jargon or unnecessary technical terms.
- Please use your organisation's branding for the report.
- The report should meet your organisation's publishing standards.
- Please use one template per each major lesson learnt and include as many as are relevant for your sub-Project. If what you learnt is more technical, this is the section to include technical information.
- The content of these Lessons Learnt Reports can be compiled (and updated, where necessary) for inclusion in the (public) Project Knowledge Sharing Report, for submission at the completion of your sub-Project.

Lead organisation	CSIRO		
Sub-Project number	DCH1		
Sub-Project commencement date	July 2019	Completion date	June 2022
Report date	19/11/2021		
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Lessons learnt

Lesson learnt #1 Handling point labels with UUIDs in building model development (DCH4)						
Category	Technical/commercial					
Choose from:	*Technical*	*Commercial*	*Social*	*Regulatory*	*Logistical*	*Other (specify)*

Describe what you learnt about this aspect of the Project.

JLL, the IoT provider for PNSW, hosts the BMS and other building data on their platform JLL Command Centre. That data was then onboarded to DCH using Rest API. JLL assigns a UUID to each data point. In order to maintain the consistency between our platforms to enable bi-directional communications, the UUIDs were retained in the stream IDs in DCH. DCH's model construction process did not have readily available scripts to handle UIDs.
This was resolved by adding details of equipment and point names in the bms-json schema. Model developers used these metadata fields to associate UIDs and data streams.

Please describe what you would do differently next time and how this would help. What are the implications for future Projects?

Given the diversity of conventions and methodologies used by different BMS and IoT providers, it is important for DCH to adapt to various practices to support scalable model development process. Development of data driven, machine learning (text based) tools that can identify relevant details of equipment, points from the point label would greatly improve the model construction time.

If your Project learnings have identified any knowledge gaps that need to be filled, please state it below.

Development of tools that can help identify building point naming conventions and support creation of building models is a known knowledge gap in the industry. DCH team's experience working with different building data further validates it.

Lesson learnt #2	DCH based remote dispatch of control signals: Implementation learnings (DCH6.1)					
Category	Technical/commercial					
Choose from:	*Technical*	*Commercial*	*Social*	*Regulatory*	*Logistical*	*Other (specify)*

Describe what you learnt about this aspect of the Project.

CSIRO have developed a software algorithm for optimally managing flexible sources in a building such as battery and HVAC. This algorithm (with battery optimistaion functionality) is being trialled in one of the pilot sites. This control algorithm sends control signals remotely from the cloud to the site. This pilot site experienced sitewide power outage. When the power was restored, battery control program got disabled and has to be manually restarted.

It was found that the site was not able to operate in the 'island' mode and switched to emergency power. This disabled the battery control operation.

Please describe what you would do differently next time and how this would help. What are the implications for future Projects?

Alert the user/owner about battery control being disabled and /or alert the application that control signals are not being dispatched.

If your Project learnings have identified any knowledge gaps that need to be filled, please state it below.

Site specific considerations need to accounted while delivering control recommendations for remote operation.