Background

Over the last decade or so, the distribution or spread of home sizes in Singapore has moved progressively towards homes of smaller sizes. This was also reported by PropertyGuru, a leading Singapore property website[1].

[1] https://www.propertyguru.com.sg/property-guides/are-hdb-flats-condos-getting-smaller-48893

As homes get smaller, property developers and consumer electronic companies are evaluating or enhancing their "solutions" with the aim of helping households better manage their use of space. More space needs to be provided for items considered essential for households versus items that are considered less essential or could be provisioned for in a different way.

One such item that is being explored for space savings is the use of communal washing machines and tumble dryers within condominiums or HDB housing estates instead of each household having such appliances each.

Problem Statement

A commercial "wash and dry cleaning" company called "Wash4U" currently operates many physical outlets where consumers wait at their outlets to use the appliances. With talk of more communal washing and drying machine services in condominiums and HDB estates, "Wash4U" see a business opportunity.

If a condominium or HDB estate adopts communal services such as common washing machines and tumble dryers, households will need to know when are these appliances available for use whilst they are enjoying the comforts of home instead of waiting at the communal space like an outlet. And not just availability, but how much longer will it take before the appliances become available.

To ascertain (i) availability or (ii) estimated time before availability, the following are some characteristics of note with washing machines and tumble dryers:

- Consumers can select different washing or drying programmes and each will result in a different time taken. For washing machines, it is not uncommon that there are many different programmes e.g. gentle wash, normal wash, quick wash, etc. For tumble dryers, there is e.g. normal dry, extra dry, etc.

Beside information related to availability, the ability to also (iii) update at what stage of the washing or drying programme that the appliance is in is desirable.

- The above means identifying and tracking the different washing / drying stages of the programme e.g. soaking, washing, rinsing, spinning for washing machines and drying, cooling for tumble dryers

The challenge with existing appliances from current consumer electronic companies lies in the fact that they are closed-systems[2]. So “Wash4U” needs a solution that can gather the data and derive the information required by a different means.

PanaS Technology is a local consumer electronics research and development company. One of the areas of their expertise is in the application of sensors for building smart or intelligent appliances. “Wash4U” has approached PanaS Technology to develop a solution that can gather the required data from their existing washing machines and tumble dryers that implements a solution for the above so that they can enhance or further digitalise their current outlet operations. The latter will also allow them to seize upon future opportunities as described above, if or when it arises. As an intern at PanaS Technology, you and your team are tasked to develop and test such a prototype.

2 https://en.wikipedia.org/wiki/Closed_system