Design Thinking Report

Introduction

This report is presented in accordance with the semi-structured interview with the stakeholders on Learning Analytics. It has four main parts which include data profile, stakeholders, three scenarios of use and two limits.

Data profile:

The data is mainly collected in three ways including physical surveys, Cohera system and wireless datasets, which reflected a total number of the population visiting St Lucia campus at the University of Queensland on a typical semester weekday. The population's size, composition and distribution over the course of the day is obtained by analysing the data. As shown in Table1 below, the data is presented by four parameters in terms of the source, type, format and update frequency.

Data source		Type	Format	Frequency
Physical Surveys		Manual counting	Excel's spread-sheets	10 minutely
Cohera System		Process image and count people entering and leaving rooms	CSV	10 minutely
Wi-Fi Datasets	Cisco Prime Sessions	A time series of distinct user sessions and their duration associated with a particular wireless access point	JSON (AWS S3 objects)	In seconds
	Floor Counts	Snapshot of devices detected, connected, and the sum of detected and connected		5 minutely
	Client Snapshots	Snapshot of every wireless client across the system and their last known state, along with a last seen timestamp		5 minutely

Stakeholders:

A stakeholder is an individual, group or organization who gets involved in the project and can be affected by the outcome of its actions. In this case, the identified stakeholders are Properties & Facilities division, Analytics Data Services team, UQ staff, students and visitors. It is obviously that Properties & Facilities and Analytics Data Services can benefit from the data directly, using collected data to create a good match between space needs and space provision, improving the staff, students and visitors experience. The UQ staff can also schedule their teaching activities by the guidance of seasonal trends over a year or targeted max values during the busy time of a semester. In addition, it may give the students and visitors more opportunities to make full use of available resources and explore their learning activities.

Scenarios of use:
Typical: Properties & Facilities can use the data to forecast future space demands. Dashboards including infographics and summary information have been produced to provide up-to-date views on campus space utilisation, helping Properties & Facilities make informed decisions on building construction, renovation and refurbishment.

Different: UQ teachers can use space utilisation data to optimise scheduled teaching activities. Room capacity vs. enrolment numbers can be compared to blend the space utilisation, ensuring students & visitors' experience an efficient use of teaching spaces, while avoiding underutilisation.

Atypical: The wireless datasets can reflect an individual's movement activities and the duration of time spent in St Lucia campus at UQ, which helps Queensland Health trace who may have close contact with the infected person, thereby preventing the virus spreading further through the community.

Limits:
Q1: How does Properties & Facilities balance costs and effective utilisation of space?
A1: Remodeling building or replacing poor quality space with fit-for-purpose accommodation may be restricted by cost or the method of construction. There is a balance between minimising cost and meeting the andragogic and research needs to staff as well as the learning and support needs of students in terms of space utilisation. What is needed in turn need to be linked to calculations of what is affordable? If the space is being used, to what extent is it needed and how much does it need to be funded? Additional information of cost budget against profit analysis in term of building construction, renovation or refurbishment is needed to help analyze how to optimize space utilisation at a lower cost.

Q2: How to fill the gap between predicted space utilization in classrooms and observed space utilization in actual teaching activities?
A2: The gap between predicted and observed level of use in space utilisation is mainly influenced by occupancy rates. Thus, more data information of student choice, study interest, timetable preference, the frequency rates of teaching activities, factors that affect students or visitors' attendance needs to be investigated and studied. In doing so, this multi-dimensional data will help understand the users' specific needs and build a better match between planned and actual use.

Conclusion
By analysing the data, stakeholders, different uses of scenarios, this report has shown how these data can be used to assist in shaping the future space requirements. The application of data science provides profound insights, thereby helping UQ maximize the benefits of space utilization.