

Modeling Social behavior on energy consumption

An agent-based with multivariate regression approach

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What is the interest of this model

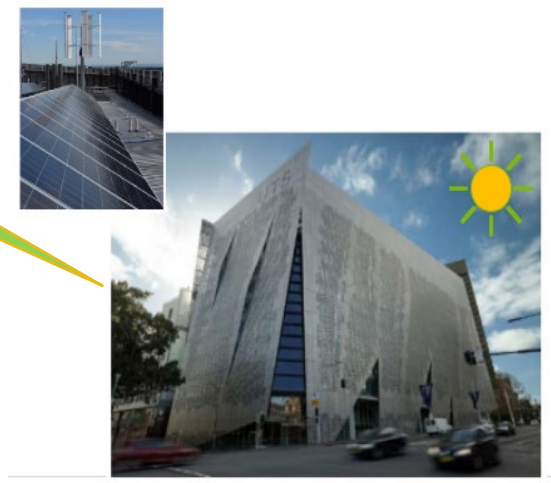


Research Question

- ▶ How behavioral influencing strategies can improve energy efficiency in commercial and educational buildings?

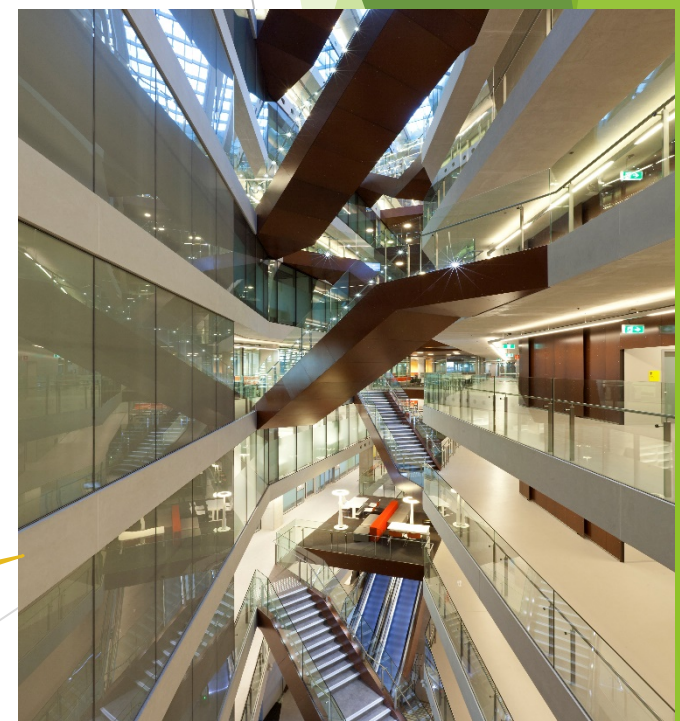
Study site (FEIT)

Main Façade

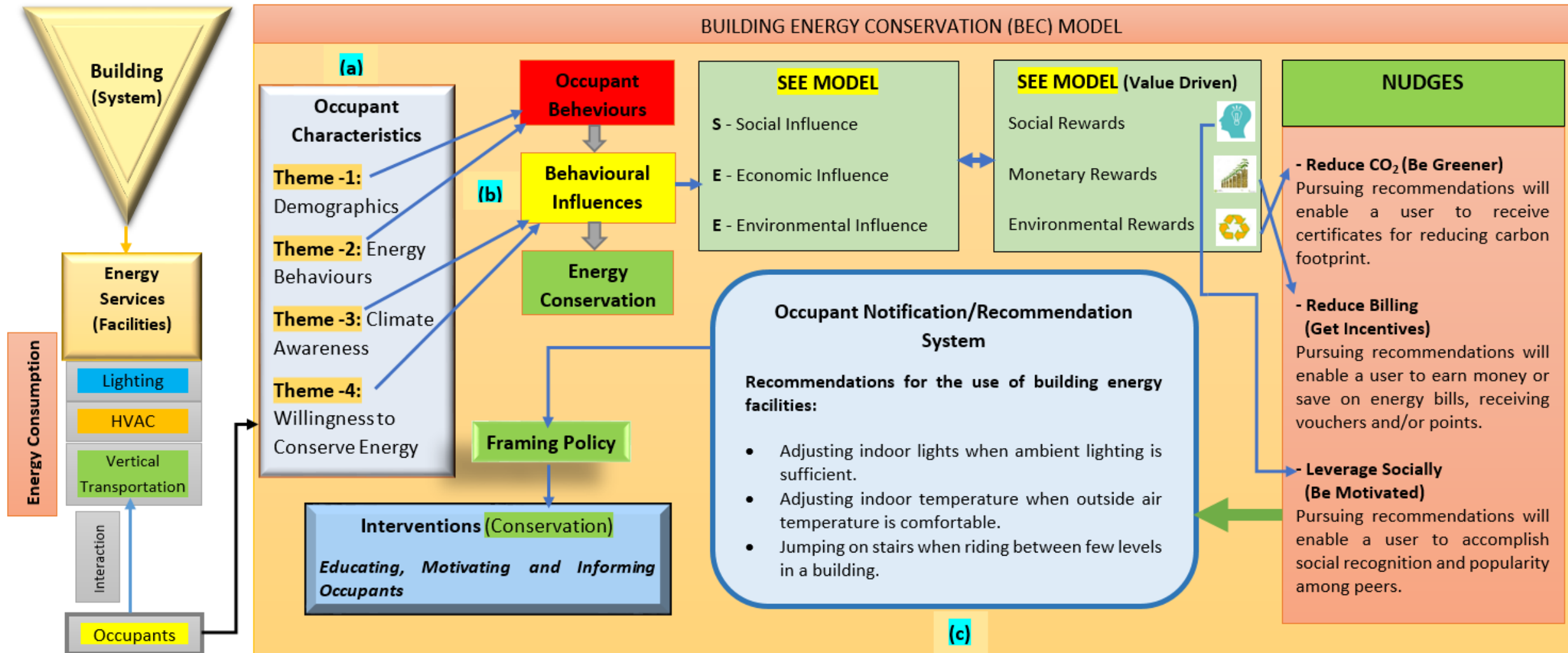


Broadway: South
Jones Street: North-East
Wattle Street: North-West

Atrium



Socio-Technical Framework



Linking

- ▶ Collect Data through survey
- ▶ Generate prediction model

Demographics	Behavioral	Climate change	Willingness to conserve energy
Age	How often do you come	I believe climate change is real	At home, I choose to buy green energy from my utility provider.
Gender	how many levels up do you most often travel	I am very concerned about climate change.	I buy only energy-efficient A+ light bulbs
Position	in a normal situation, do you prefer to take lift or stairs	I think that humans are responsible for climate change.	By changing my energy consumption habits, I can affect other people habits.
Education	do you have any health issue preventing you from taking the stairs	The amount of energy we use influences the climate significantly.	I would be willing to change my behaviour to save energy.
income	how much time would you wait for the lift before taking the stairs		I look for ways to save energy at UTS.
weight	what kind of motivation would motivate you to use stairs		I consciously use the stairs instead of the LIFTS whenever I can to save energy.

Prediction Model

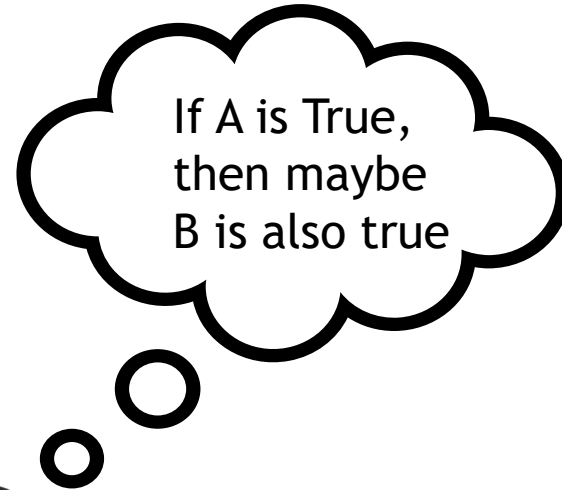
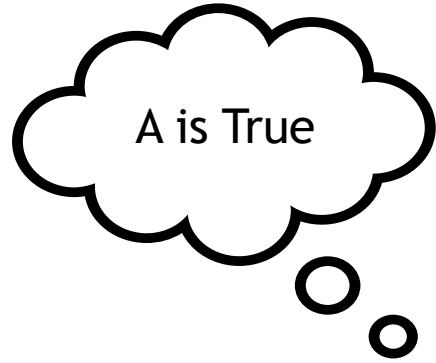
- ▶ I consciously turn off lights and appliances when I do not need them no matter where I am.
- ▶ In a normal situation, do you prefer to take stairs or use lifts to get to your destination?

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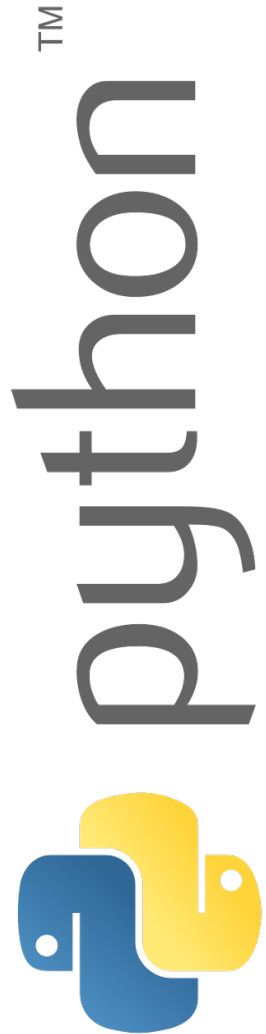
Reward System

- ▶ Money
- ▶ Public Appreciation
- ▶ Extra Holidays
- ▶ Bonus Marks
- ▶ Discounts
- ▶ Medals

Influence



Data Science with Python



Simulation Model

The background of the slide is white with abstract green geometric shapes on the right side. These shapes include overlapping triangles and polygons in various shades of green, from light lime to dark forest green. A thin, light gray line runs diagonally across the white space, intersecting the green shapes.

Influence and predictive model

Initial State

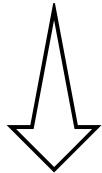
Question A	Question B	Question C	Behavior S
2	3	4	3



Education on A

Meeting State

Question A	Question B	Question C	Behavior S
3	3	4	3

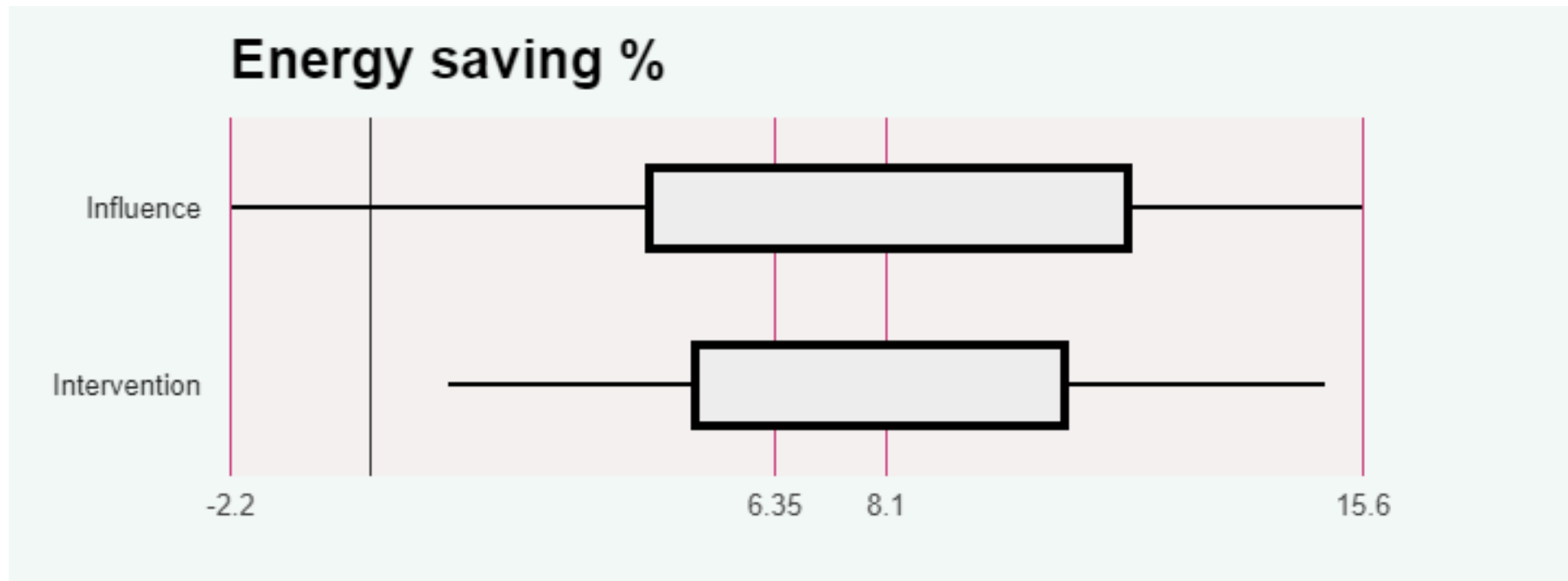


Recalculation of S

Final State

Question A	Question B	Question C	Behavior S
3	3	4	4

Results



Questions?

