The Value of Variance
“Buildings don’t use energy: people do!”

US DOE, 2011, Quadrennial Technology Review
Energy vs Salaries

Allen et al, 2015, Environ Health Prospect
IEQ and Office Work Performance

Comfort and Satisfaction

Standards cannot always provide comfort and satisfaction for all

The *standard average* user is an idealization

Comfort and health might be driven by different needs
More than just the absence of disease…

Cardiovascular
Digestive
Endocrine
Immune
Muscular

Nervous
Reproductive
Respiratory
Skeletal
Urinary

Image credits: DELOS
Inter- and Intra-individual variability
Healthy excursions outside the comfort zone…

- Static and uniform conditions might lead to *experiential monotony*
- *Neutrally-acceptable* environments might reduce opportunities for control and adaptation
- *Sensory variability* may benefit cognitive performance, experiential delight and health
- From *risk reduction* to health promotion

Image: Leonardo da Vinci, *The Vitruvian man*
A Motivation

BUS Non-Domestic survey:

BUS Wellbeing survey:

Life evaluation, not a hedonic (pleasure) measure
Productivity to Performance

Healthy City Design 2019

*A Proposition*
Systematic Productivity Problems
Your goal

Have you the freedom to choose yours?
How “useful” is an activity to help you perform?

Is it useful to buy this ball to practice towards your goal?..

(Your goal defines your rule for judging)
How much did everyone else appreciate your goal?

**Performance (scored!) -> Productivity**

Some quantitative methods to gain insight:

- Stock exchanges (commodities)
- Hedonic regression (planning)
- Satisfaction surveys (planning + indoors)

= value neutral (but value laden) outcomes.

A process of satisfying most people with least resources = more “pop” culture?

How well do you identify with popular culture?...
A Process to Develop Performance (A Critical Reflection)
What makes understandable goals for engineers?

*Extension of humanities = human understandable*

- “I want to help with an immediate distress.”
- “I want to spend more time identifying with my religion.”
- “I want to make as many people happy as I can.”

(... political, if non-individuated)

*Extension of physical sciences = human confusion*

- “… net domestic production GWP$_{CO2}$ at 2050AD == 0…”

(... why precisely?... a requirement to justify, not a reasonable goal in itself...)

Bertrand Russell (“What I Believe”, 1925, from Wikiquote...)

We are and irrefutable arbiters of value, and in the world of value Nature is only a part. Thus in this world we are greater than Nature. In the world of values, Nature in itself is neutral, neither good nor bad deserving of neither admiration nor censure. It is we who create value and our desires which confer value. In this realm we are kings, and we debase our kingship if we bow down to Nature. It is for us to determine our good life, not for Nature – not even for Nature personified as God.

Explaining uncertainty in setting requirements is diligent and impressive
Understandings of “well-being”: a relevant goal

Arup’s organisational culture seeks to support Sustainable Development whilst returning a robust 10% revenue profit...

This is what Sustainable Development means to me in terms of a goal:

“Promote intergenerational well-being, whilst treating all humanity with minimum decency.”

(...a combination of values and rights...)

Have I achieved this? Not convinced...
Means: How can I influence human well-being?

I am cautious. By developing enabling assets, I can help society be more precise with their influence on physical (production) assets.

Enabling assets may be defined as code and released as software for global application.
Evaluation: How might I be more sustainable?
Relevant key performance indicators

- Service to personal well-being vs my understanding of sustainable development
- Positional goods (eg. use of luxury items and awards to confer status);
- Conservative reinforcement (ie. social bias created by property ownership);
- Accessibility (ie. universal design);
- Environmental externalities (ie. am I fairly compensating for my pollution?).

“Good” is essentially indefinable and often depends on the target audience. I need to respect that, particularly if employed to do so.
Something to think about…
The modern workplace and its links to health

1. Is job productivity the correct measure of a successful workplace design?

2. What are the adequate measures of a successful workplace design?

3. How should workspaces be designed, organised, lived and appropriated?