A 'SMART' BUILT ENVIRONMENT?

What is smart? I thought I knew the meaning of smart - an adjective, usually used to describe a person. But things changed when I came across it being used to describe new age phones. It hasn't just stopped there, going on to be used for many other things including but not limited to our cities (Smart Cities!), parks, infrastructure, buildings, and homes, thus encompassing a scale that goes from macro to micro. Although I do not judge our built environment based on its smartness, or lack thereof, it has made me wonder what do the users of the word 'smart' really mean in the context of the built environment.

Admittedly, technology is advancing every year in all possible areas. Sometimes I look back in nostalgia at how our lives have changed over the years. And, some of us wonder how we even lived before the tech age! Depending on age group, professional background, and personal preferences it may be a matter of debate whether 'smart' change has been for better or worse but the changes are, undoubtedly, profound.

However, the discussion here is about using the word 'smart' for all things new and, particularly, all things new in the built environment. Gemma Playford was spot-on about how 'sustainability' became an overused word. 'As the ideas it embodies have increased, the references to the term have multiplied, so that now it encompasses everything from urban drainage systems to improving education. As a result, no one seems to be sure exactly what it means or includes.' (Gemma Playford 2012, Thoughts Arup). This also holds true for the word 'smart'. We have been swamped by smart concepts, from street bins to smart technology in the public realm, smart contracts, smart parks, smart homes, smart cars and so on, never endingly.

This public park in Docklands features play areas for all ages and an outdoor gym. It is a wonderful usable public space, however I do question why it is promoted as 'New Age Smart Park' in architectural articles.

With this on-going technological wave of smartness threatening to dictate how we live and experience our built environment Mary Ann Jackson, Accessibility Specialist and PhD Candidate, is concerned that built environment practice is in danger of entering a neo-medical era of 'Technological Model of Disability', where 'technology' will resolve all possible issues. Supposedly assistive, technologically advanced building products such as lift destination control systems, electronic doors, dynamic electrochromic glazing, automated window blinds, and the like are often 'sustainability' driven and hence enticing due to potentially substantial energy use reductions. Invariably such 'smart' technology is added-on to new, individual, buildings; built environment practitioners will again be absolved of the worry of achieving existing built environment accessibility, at the neighbourhood scale. It can also be

observed that the current architectural education system is shifting ever-more towards adopting computational approaches for understanding and designing the built environment, making the process somewhat mechanistic rather than organic, empathetic, and people-centred.

Recently, I participated in evaluating the most recent iteration of the High Capacity Metro Train mock-up. I attended with some wheelchair users and their family members who have been part of the consultation from the outset. The participants had done a great job in expressing all of their ideas and concerns (after years of travel experience using Metro) about making the new train design more accessible, convenient and safe for everyone to use. As in the past, the new trains' front carriage is still the main accessible carriage as the proximity of the driver allows more efficient operation of the portable ramp. However, even after many conversations and elaborate consultation, the users still had comments and feedback to give on various small but important issues like getting on and off the train, journey maps, fire exit sign, the width of the portable ramp, and bicycle storage to name just a few. It was after witnessing the mock-up and watching the wheelchair users move around the front carriage I realized that to really become smart we need to be more collaborative, have more conversations amongst users, designers and stakeholders at a deeper level, and learn to properly listen and appreciate the lived experience of others.

All the way from concept design through to construction, avant garde ways of design thinking and approaches are becoming highly derivative of technologies such as parametric design, BIM modelling, Virtual Reality, and Augmented Reality. This is, potentially, creating a wider gap than we already have between built environment designers and diverse end users. We want technology to smartly enhance our lived experience rather than making life more complicated.

Royal Melbourne Hospital lift control system

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Continuing our series on the Seven Principles of Universal Design

Principle 5: Tolerance for Error

Contemporary built environments are 'systems'. Smart built environment systems allow tolerance for error. Murphy's law is an adage or epigram that is typically stated as: "Anything that can go wrong will go wrong". Application of the Principles of Universal Design will minimise or eliminate the risk of error in crucial systems.

Error tolerance is the design of things to be resilient to human error. The term is applied to user interfaces that are difficult to get wrong. When a human error does occur, error-tolerant designs gracefully detect and handle it. The following are examples of error tolerance.

Validation
Validating input to prevent mistakes. For example, preventing stock orders with a price that is too far from the market price such as a bid of $15 for a stock trading at $5.

Input Correction
Automatically suggesting a correction to input. For example, a search that makes a correction based on edit distance. The user is typically given a chance to override the suggestion to allow for unique input.

Input Flexibility
Systems that allow for a wide range of inputs to be understood. For example, a button with a generous touch target so that you don't have to touch it with precision to work. Voice commands may accept hundreds of variations of a single command.

Undo
The ability to undo actions or series of actions.

Shutdown
A machine that turns off if the user does something dangerous. For example, a camping heater that turns off if it is knocked over.

Friendly Errors
Telling the end user exactly what's wrong as opposed to a cryptic message or beep.

Clear Warnings
Warnings that are clear and direct. For example, an altitude warning in an aircraft that says "go up, go up, go up."

Authentication & Authorization
Systems of authentication and authorization such that people can't do things without a specifically granted permission. For example, a new employee who doesn't have system authority to accidentally delete your customer database.

Limits
Systems that enforce operational limits. For example, flight envelope protection that prevents a pilot from pushing an aircraft beyond its structural and aerodynamic limits.

Principle 5: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.
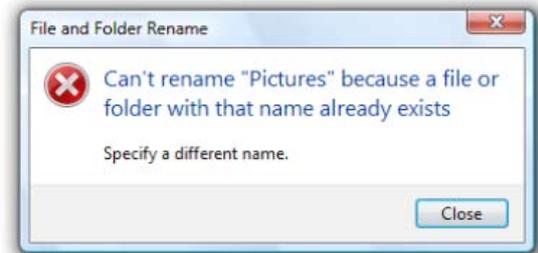
GUIDELINES:

5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.

5b. Provide warnings of hazards and errors.

5c. Provide fail safe features.

5d. Discourage unconscious action in tasks that require vigilance.

If you would like to discuss collaboration possibilities across the areas of accessibility, research or architecture for any of your projects, please contact our office.

File and Folder Rename

Can't rename "Pictures" because a file or folder with that name already exists

Specify a different name.

Close

Poka Yoke
Is the term used for the Japanese design culture of fool-proofing processes, vehicles, machines, products and services by building in constraints that prevent the user from making common errors or mistakes.

Other Poka Yoke examples:

- Batteries than can only be installed in one way
- Plugs that won't fit in the wrong way.
- Automatic braking systems in cars.
- Microwave doors typically can't be open when the microwave is operating.
- Products that can only be assembled correctly.
- Doors that can't be open when a vehicle is moving.
- Reverse lockout on the transmission of a moving automobile.

Tactile Indicators, stair nosing, handrail extension and stairs inset from wall element provides tolerance for error when using these stairs.

CALENDAR

March 2018

5	Design Principles and Practices, Barcelona, Spain
9-10	HOUSE & HOME '18 / II. International Interdisciplinary Architecture and Urban Studies Conference. Istanbul, Turkey
21-23	Education And Poverty. Villarrica, La Araucania, Chile

April 2018

12-13	Poverty and Social Exclusion: A Life Course Perspective New Delhi
13-14	ARCHDESIGN '18 / V. Dubrovnik, Croatia
28	Somewhere In Between: Borders and Borderlands. London

May 2018

8-10	Urban Growth 2018. Alicante, Spain.
21	Invictus Wellbeing Conference Newcastle NSW
31 - 3 June	Urban Struggles in Mediterranean Cities: The Right to the City and the Common Space Athens

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