

## PhD Title:

Communicating universal design:  
designing an Irish building rating  
system

Eoghan Conor O Shea

- Outline of PhD research
- Background of universal design
- Context of research
- Purpose of research
- Research objectives
- Universal design & sustainable development
- Specific research topics

## PhD Title:

Communicating universal design:  
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## PhD funding:

IRCSET

(Irish Research Council for Science Engineering and Technology)

NDA

(National Disability Authority)

## Supervisors:

Dr Sara Pavia

School of Engineering, TCD

Prof. Mark Dyer

TrinityHaus, TCD

# Universal Design

*Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaption or specialized design (CUD, 1995)*

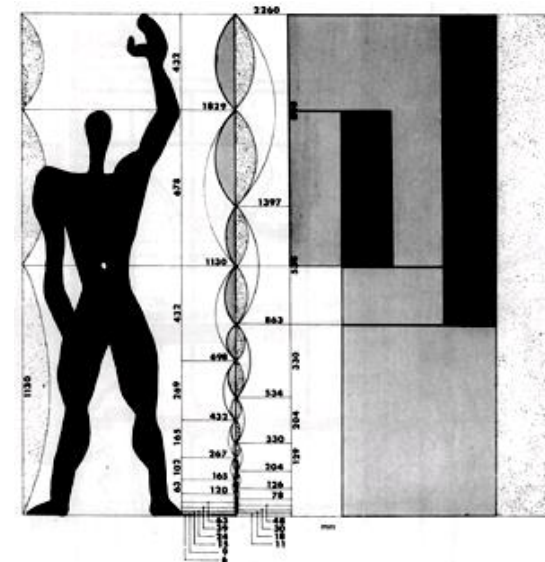
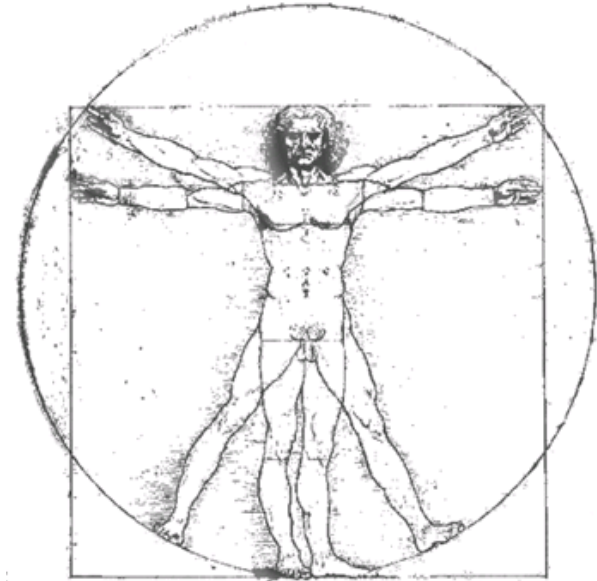
*Universal design refers to the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age, size or disability. (Disability Act, 2005)*



- Conceptual basis in move toward equity in access to environments and services.
- Post WW2 disability movement that became part of the civil rights movement
- Universal Design posited in the 1980s by Ron Mace – broadens the ideology to include **all** potential users of environments, products or services.

# Universal Design/Accessibility

- Both a move toward assumption that environments, not people, cause of barriers to full participation in society
- Move away from “deficiency reduction” to “growth-promotion” concept of disability. (Lawton, 2001)
- “Universal Design can be said to add principles like “the same entrance for all” or “the same opportunity for all” to accessibility, in order to ensure participation and integration in a more equal manner.” (Ginnerup, 2009)
- Universal design a user-centered design approach which mainstreams the needs of specific user-groups to general benefit.



## USA:

- Post WW2, returning veterans raised awareness
- 1950s Tim Nugent at University of Illinois, writes 1<sup>st</sup> set of accessibility standards (incorporated in ANSI Accessibility standard, 1961)
- 1960-80 Civil Rights movement & Disability rights movements
- 1968 Architectural Barriers Act (federal buildings);
- **1990 Americans with Disabilities Act (ADA)**
- 1995 Principles of Universal Design formulated in University of North Carolina

## International:

- **UN Standard rules on the Equalization of Opportunities for Persons with Disabilities**
- 1999 Accessibility Guidelines first established by ISO
- ISO Guide 71 Guidelines for Standards development to address the needs of older persons and persons with disabilities (basis for CEN/CENELEC Guide 6 YEAR)
- 2006 UN Convention on the Rights of Persons with Disabilities adopted

## Europe:

- 1950 European Convention for the Protection of Human Rights and Fundamental Freedoms
- 1992 CE Recommendation No, R(92) 6 on coherent policy for people with disabilities
- 1997 Amsterdam Treaty Article 13 (on non-discrimination)
- 2003 European Concept for Accessibility
- 2006-15 Council of Europe Disability Plan

## Ireland:

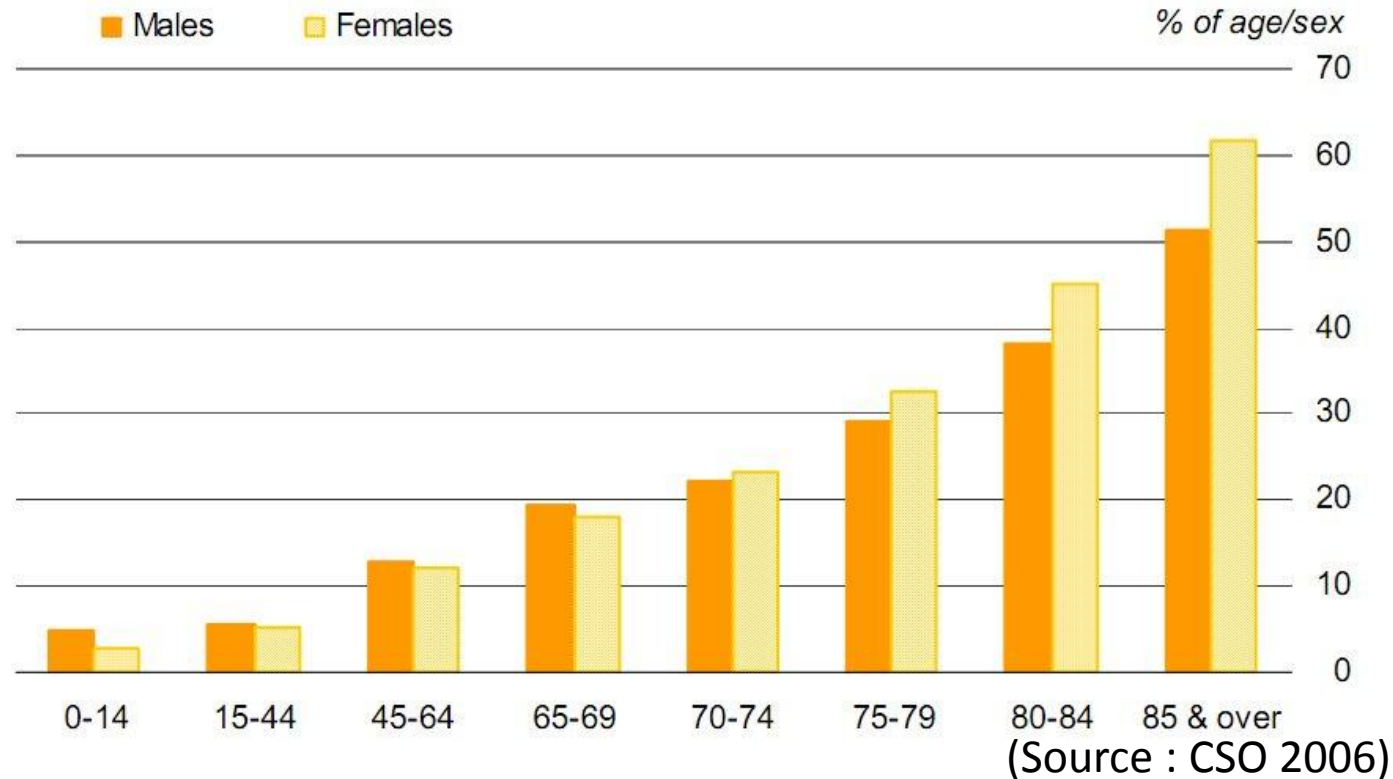
- 1992 Building Regulations Part M (non-dwellings)
- 2001 Building Regulations Part M (dwellings)
- 2002 Buildings for Everyone
- 2005 Disability Act
- 2010 Revised Building Regulations Part M, incorporating definition of universal design

- 9.3% of Irish population have disability (Census 2006)
- Mobility (56%) and Pain (47%) were most frequently reported disabilities in National Disability Survey (ESRI 2006)
- Over 50000 people admitted to hospital each year as a result of injury





## Prevalence of Disability in different age-groups



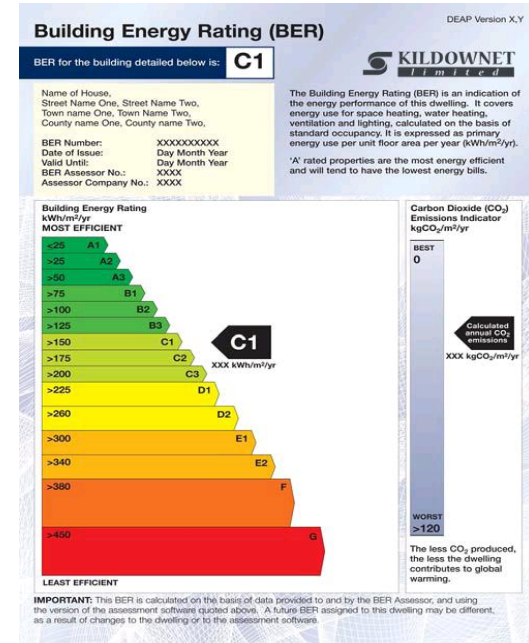
- 11% of Irish population over 65 in 2006
- 22% projected to be over 65 in 2050
- 42% of disabled population over 65
- 4 out of 5 adults of working age with disability acquired it as adult

## Other users



# Purposes of Research

- Communicate universal design – build on success of BER rating system of promoting merits of energy efficient design to users, designers and building commissioners.
- To show a roadmap for delivering a rating system by examining analogous systems in Ireland and abroad and through direct assessment of specific buildings.



# Research Objectives

- Comprehensive review of accessibility codes, standards and related legislation
- Comprehensive review of built environment assessment theory, methods and guidelines, both post- and pre-occupancy
- Development of a universal design assessment systems for the built environment
- Development of a universal design rating system for the built environment

# Short-term objectives

- Identify buildings for Post-Occupancy Evaluation analysis
- Design of preliminary assessment methodology
- Publication of results and analysis

# Sustainable Development & Universal Design

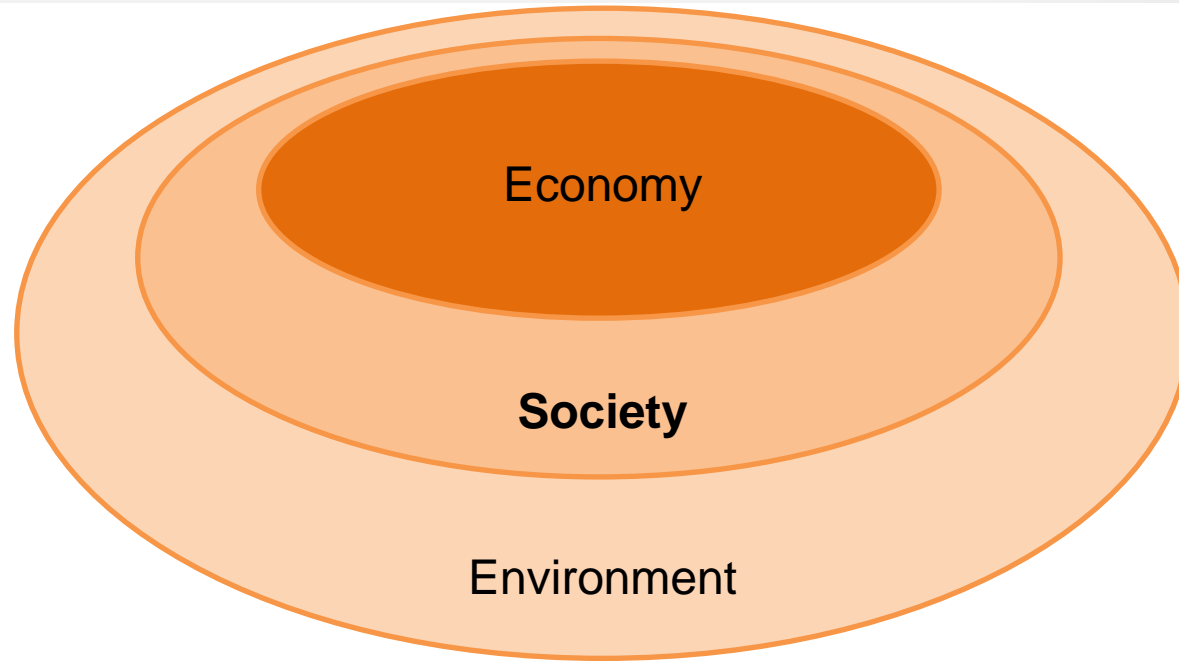


Diagram of “strong sustainability” where human sphere is embedded in a natural system – based on Rawls basic principles of justice.

(Source : Ott 2003)

- “Sustainability means that present and future persons have the same right to find, on the average, equal opportunities for realising their concepts of a good human life.” (Ott, 2003)

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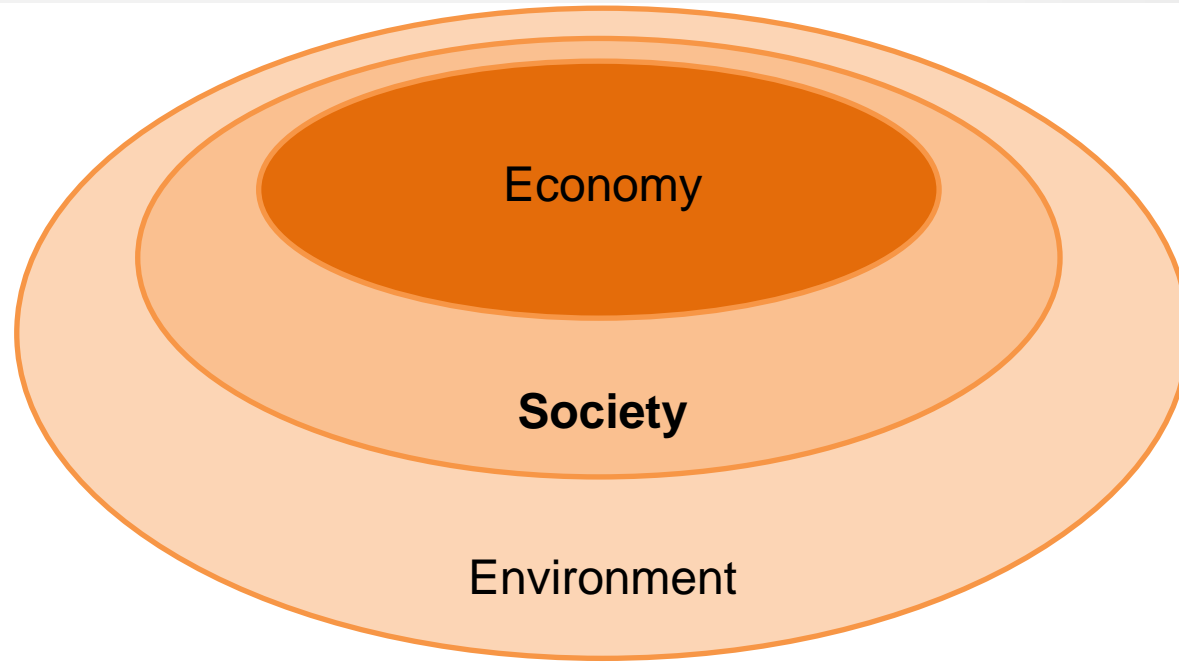


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# Sustainable Development & Universal Design

## Principles of Universal Design (Centre of Universal Design, UNC, 1995)

- Equitable use
- Flexibility in use
- Simple and Intuitive
- Perceptible Information
- Tolerance for Error
- Low Physical Effort
- Size and Space for Approach and use



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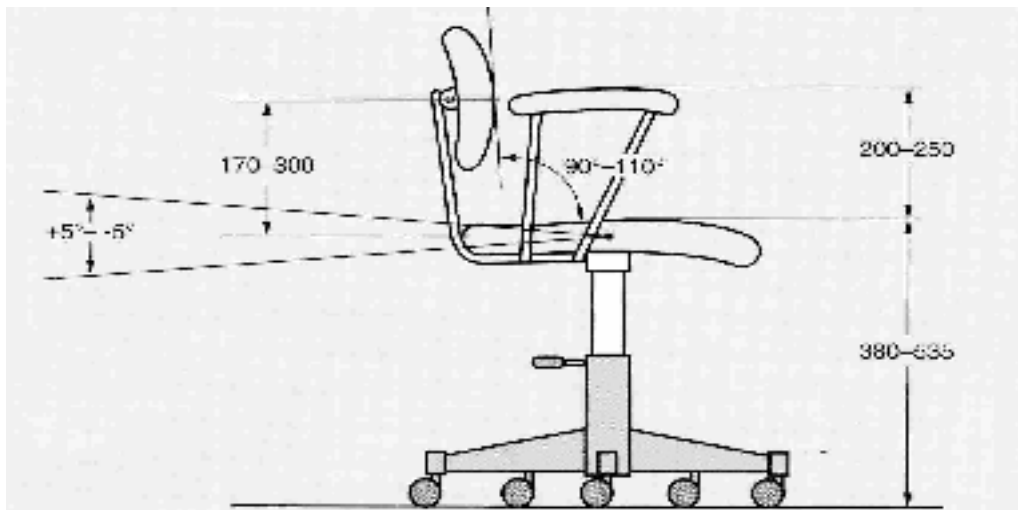
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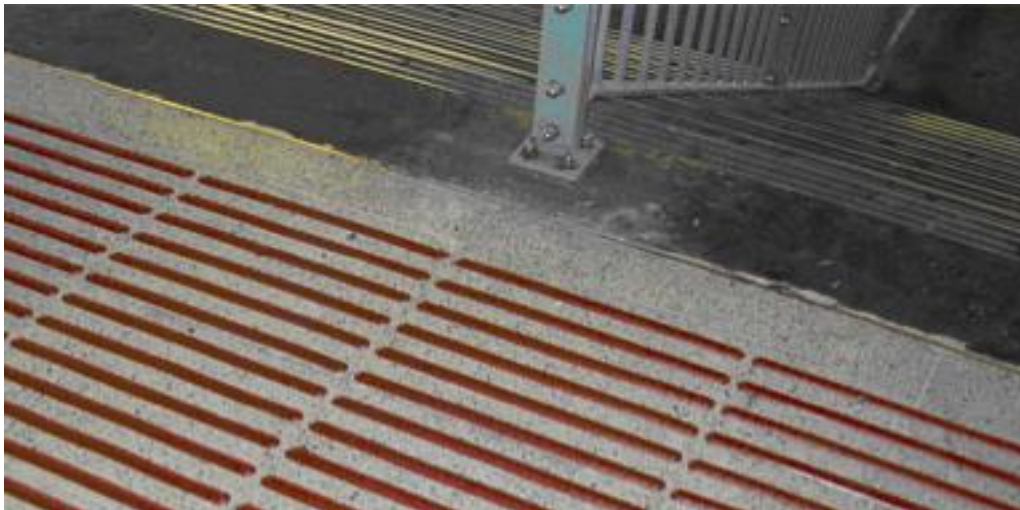
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# Assessment Approach

- Human need interpreted in fields such as environmental psychology, facility management, philosophy, social sciences
- Post-Occupancy Evaluation (POE) and other building assessment methods can relate interdisciplinary research to specific buildings
- POE research has and can be used to create specific assessment systems, such as the BER system, BREEAM, LEED – and also universal design assessment methodology, building on checklist and questionnaire systems proposed by the GUDC, Leonard Sandler, and others
- Hierarchies of need, after Maslow (1954), can be used as way of effectively reading and evaluating built environments, along with objective auditing factors.
- Feedback from users, commissioners, and managers can improve the responsiveness of the building to need and improve user experience, and this can be fed forward to future building works and renovations
- This is also an important element of an effective assessment system

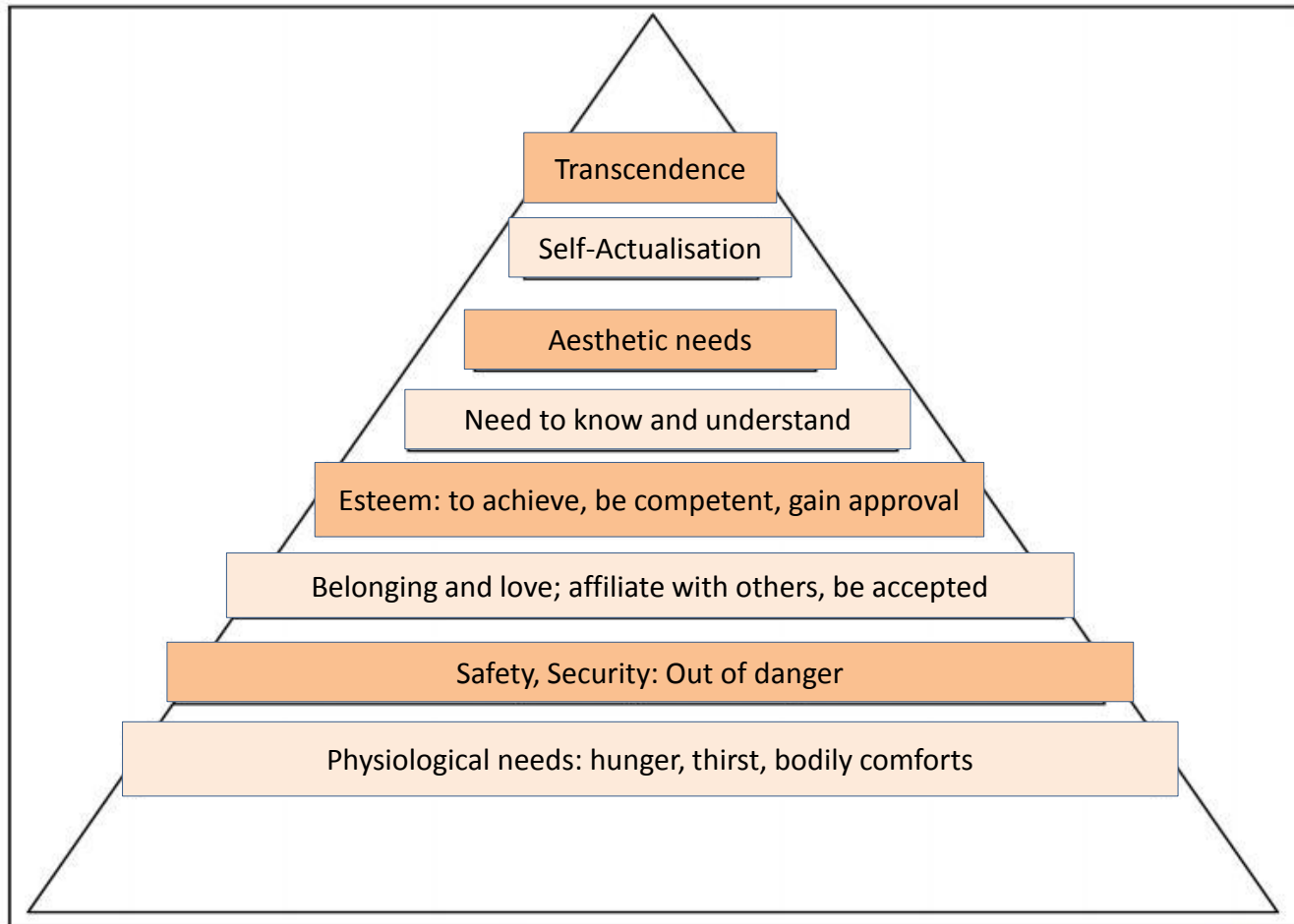


# Purpose of assessment

- As clients are not always users, important to bridge a connection between designers and end-users.
- Existing constructed environments provide best simulation models available.
- Cybernetic feedback systems based on a machine sensing what it is doing and “initiat[ing] corrections of its actions when going astray” (van Foerster, 1985)
- There are 3 strata of Performance criteria to be considered (Preiser, 2001)
  - Health/safety/security (based on standards and codes)
  - Function and efficiency (state-of-the-art knowledge and performance)
  - Psychological comfort and satisfaction (research based design guidelines)

# Assessing User Needs

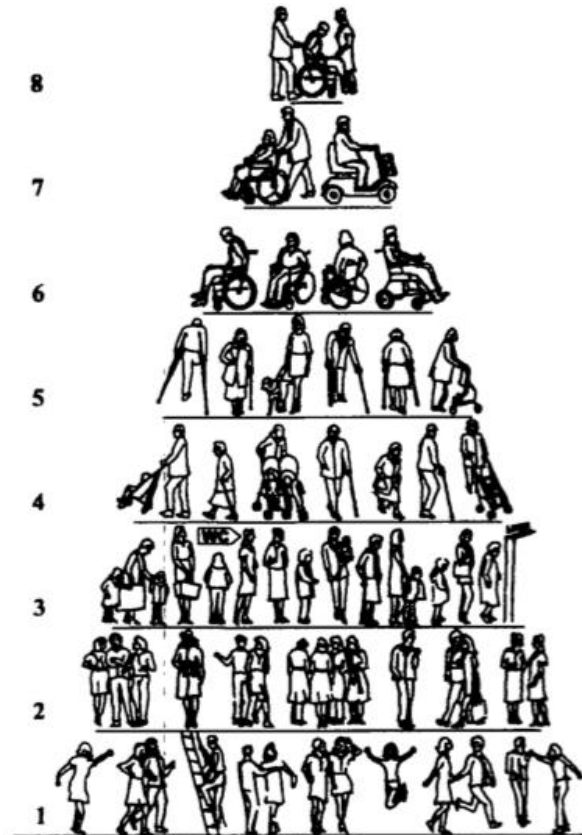
Human need is essential in considering universally designed buildings.



Hierarchy of human needs (Maslow, 1956)

# Assessing User Needs

Human need is essential in considering universally designed buildings.



Pyramid of disability (Goldsmith, 2000)

# Environmental Affordances to Needs

## Environmental Affordances and Personal Need Analogues


ENVIRONMENT	PERSONAL NEED
Communality-privacy	Privacy
Sociopetality-sociofugality	Affiliation
Informality-formality	Order
Familiarity-remoteness	Novelty
Accessibility-inaccessibility	Function
Ambiguity-legibility	Cognition
Diversity-homogeneity	Stimulation
Adaptability-fixity	Autonomy
Comfort-discomfort	Comfort

(Source: Lawton, 2001, adapted from Brill & Krauss 1999)

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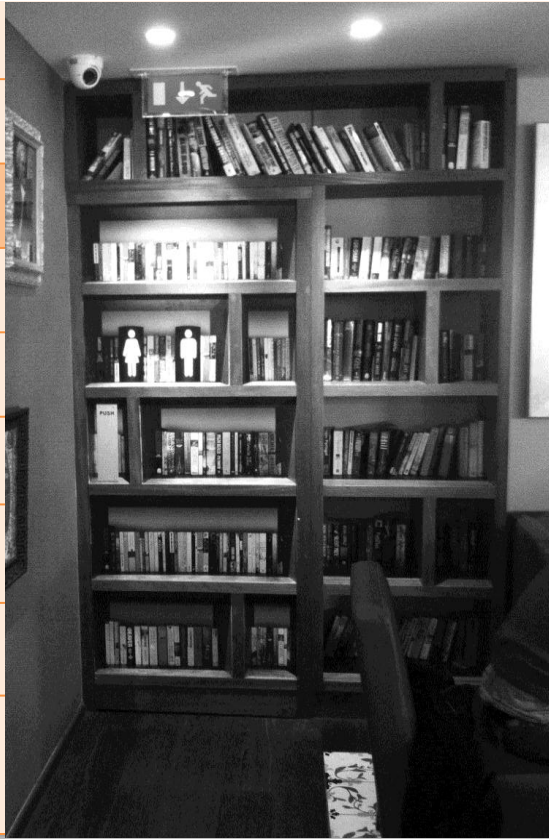
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# Legibility of the built environment

Traditional encoding of built environment – building as a book or narrative device





# Legibility of the built environment

Architectural objects as significant forms (Eco, 1965)

The stairs stimulates the user to ascend.

The pathway stimulates the user to follow.



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Architectural objects as significant forms (Eco, 1965)

The stairs stimulates the user to ascend.

The pathway stimulates the user to follow

History can rob the built environment of its meaning



# Finally...

- Architectural space is relational – it derives from social interactions (Lefebvre, 1974)
- Architectural space can only be fully formed if the community as a whole have an opportunity to participate in it.
- Post-Occupancy Evaluation in the sense advocated by Preiser [as a regular, systematic device in built works], ensures users needs are constantly revisited and feedback repeatedly sought
- Universal design should be the key component in any assessment system to assure participation to the fullest extent

# Achievements to date

- November 2010 - Poster presentation at the GlobeForum Dublin conference in , 2011
- January 2011 - Shortlisted for Fulbright Scholarship
- February 2011 - Presentation at the Sustainable Development 2011 1<sup>st</sup> Annual European postgraduate conference, Dublin

# Thank you

## Communicating universal design: designing an Irish building rating system

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