

INSTITUTE OF MEDICINE AND
NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

HEARING LOSS AND HEALTHY AGING: AN IOM_NRC WORKSHOP



Institute for Human Centered Design

Driving Innovation: Universal Design

14 January 2014

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Institute for Human Centered Design



An international education and design non-profit dedicated to enhancing the experiences of people of all ages and abilities through excellence in design.



www.HumanCenteredDesign.org

Design powerfully and profoundly influences everyone and our sense of **confidence, comfort, and control.**

2 core ideas...

Variation in ability is ordinary, not special, and affects most of us for at least part of our lives.



Scope of Services

Regional, National, International

Design & Consulting on Accessibility and Universal Design

- ✓ built environment
- ✓ products
- ✓ Information + Communication Technology
- ✓ Service design

Technical Assistance (federal funding)

- ✓ Fair Housing Accessibility FIRST DCRC – All of U.S.
- ✓ Americans with Disabilities Act – New England

Education & Training on Accessibility and Universal Design

Research – analyze ideas, test prototypes, refine features



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IHCD User/Expert Lab

- Database of 200+ people from 16 to 90+
- Wide range of physical, sensory and brain-based issues
- Mix of cultural backgrounds
- Analysis of products, technologies, environments, services
- In-situ or on-site @ IHCD
- Analyze ideas, test prototypes, refine features and identify problems, post-occupancy evaluation, existing condition survey

First, a note on accessibility

Universal design begins on a base of accessibility.

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Effective Communication

The requirement intends to support **equality of experience**: whatever information is written or spoken is as clear and understandable to people with disabilities as it is for people who do not have disabilities.

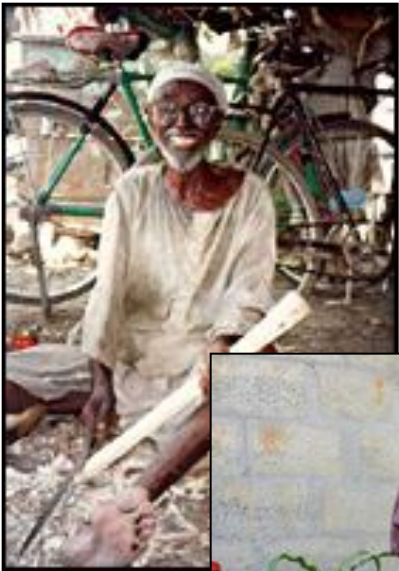


The 21st century case for inclusive design

20th century impetus to Social Sustainability

Profound *POSITIVE* impact of human behavior. . .

We live longer & survive more - across the globe



A Venn diagram with two overlapping circles. The top circle is light gray and labeled 'Environmental Sustainability'. The bottom circle is a darker gray and labeled 'Social Sustainability'. The intersection of the two circles is highlighted in yellow and contains the text 'Diversity', 'Interdependence', 'Data-Driven', and 'Long View'. The entire diagram is enclosed in a white rounded rectangle with a black border, set against a yellow background.

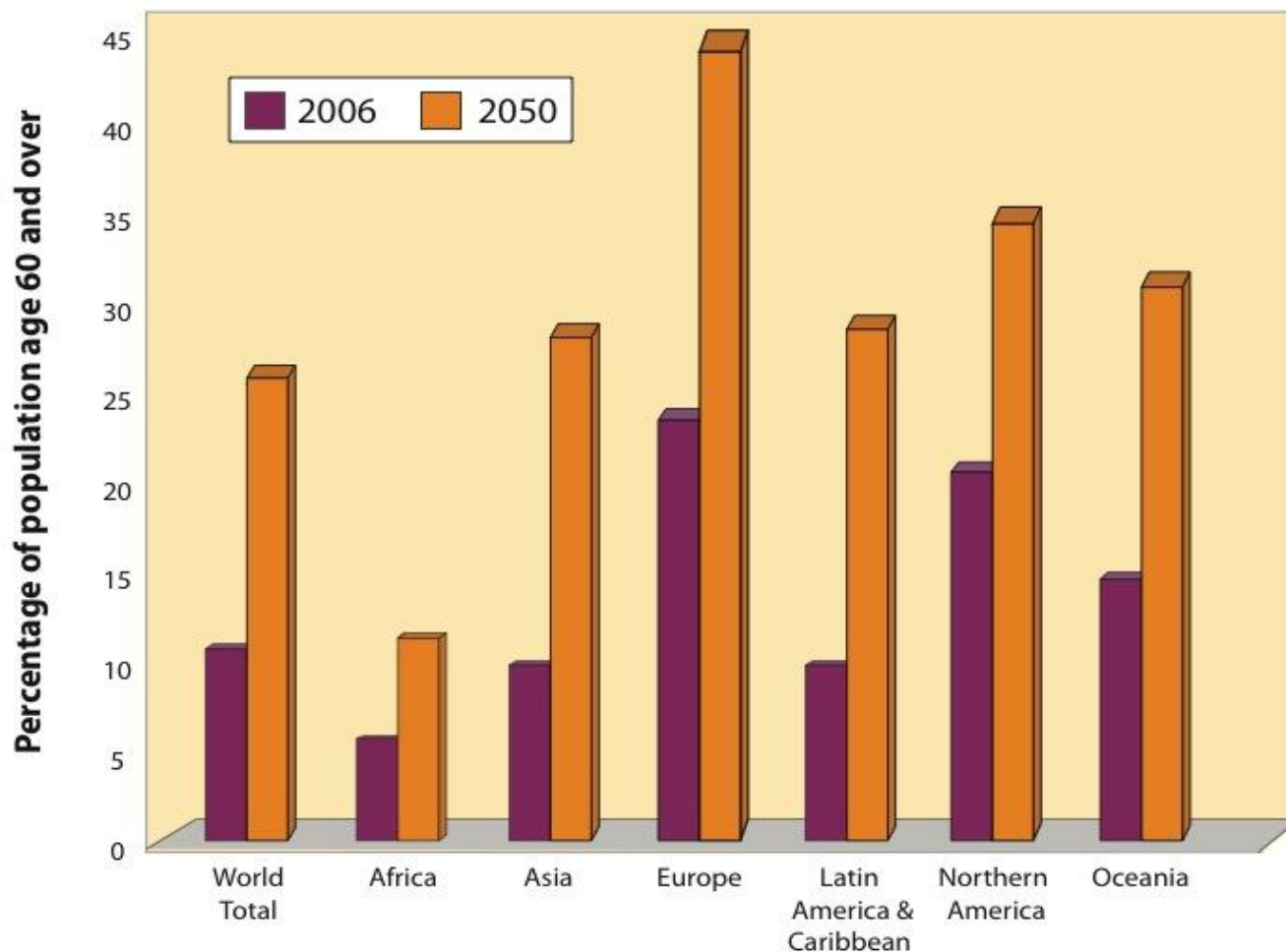
**Environmental
Sustainability**

**Diversity
Interdependence
Data-Driven
Long View**

Social Sustainability

Global Aging #1 Catalyst

Percentage Increase in Age 60 + by Region, 2000-2050



Source: *World Population Prospects, The 2006 Revision, Executive Summary.*
The Population Division, Department of Economic and Social Affairs, United Nations Secretariat



10,000 baby boomers turn 65 every day
until 2031. . .

We act as if ageing is discretionary...



‘We have an aging society and an adolescent culture.’

*Barbara Defoe Whitehead,
Social Historian*

12 2010 Cher @ 64



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[Adaptive Environments]

WORLD REPORT ON DISABILITY

#2 Catalyst



**one in seven people
on the planet have
a disability**



**80% of them live in the
developing world**

Most common reasons for functional limitation of adults in the US...

- ✓ Arthritis
- ✓ Back problems
- ✓ Heart disease
- ✓ Respiratory disease

* 50% of
people 65+
have a
disability

Number of adults with a disability in US 56.7M* (2012)

3.6 M use wheelchairs or scooters, projected to grow to 4.3 in 2030.

30.6 M difficulty walking or climbing stairs



There are more than 60 definitions of disability in the federal government alone.

A shift away from 'special needs'

Guidance on Planning for Integration of Functional Needs Support Services in General Population Shelters

November 2010



FEMA



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[Adaptive Environments]

Reframing the role of design



***universal design...
inclusive design...
design-for-all?***

***...a framework for the design
of places, things, information,
communication and policy
that focuses on the user, on
the widest range of people
operating in the widest range
of situations without special
or separate design...***

***Human centered
design
(of everything)
with everyone in mind***

Universal Design Principles

1. Equitable Use
2. Flexibility in Use
3. Simple, Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach & Use

[Developed by a group of US designers and design educators from five organizations in 1997. Principles are copyrighted to the Center for Universal Design, School of Design, State University of North Carolina at Raleigh. The Principles are in use internationally.]

Global policies responsive to new patterns & and the role of design



Redefined Disability in 2001 . . .

- ❖ Functional limitation as a universal human experience
- ❖ Equalized mental and physical reasons for limitations
- ❖ Defined disability as a *contextual* variable:
Functional limitation becomes disabling based upon the intersection with environments
 - ✓ *Physical* environment
 - ✓ *Communication* environment
 - ✓ *Information* environment
 - ✓ *Policy* environments
 - ✓ *Social* environments





Recommended **Universal Design** as the most promising framework for identifying the “facilitators” that would minimize disability and support independence and full community integration.





United Nations

Programme on Ageing

*towards a society
for all ages* 

Madrid International Plan of Action on Ageing (2002)

Priority Direction III:

Ensuring enabling and supporting environments



UN Convention on the Human Rights of People with Disabilities (CRPD) 2008



158 nations signed
137 nations ratified

- Respect
- Non-Discrimination
- Participation
- Inclusive design
- Equality
- Accessibility



Healthcare



ClearRx system



(1) Easy I.D.

(2) Code red.

(3) Information hierarchy.

(4) Upside down to save paper.

(5) Green is for Grandma.

(6) An info card that's hard to lose.

(7) Take "daily."

(8) Clear warnings.



Singapore - hospital reinvented itself to be more universally designed
e.g., staff names and faces for each room on each shift



Duke Cancer Center patients use Tablet PCs for symptom screening

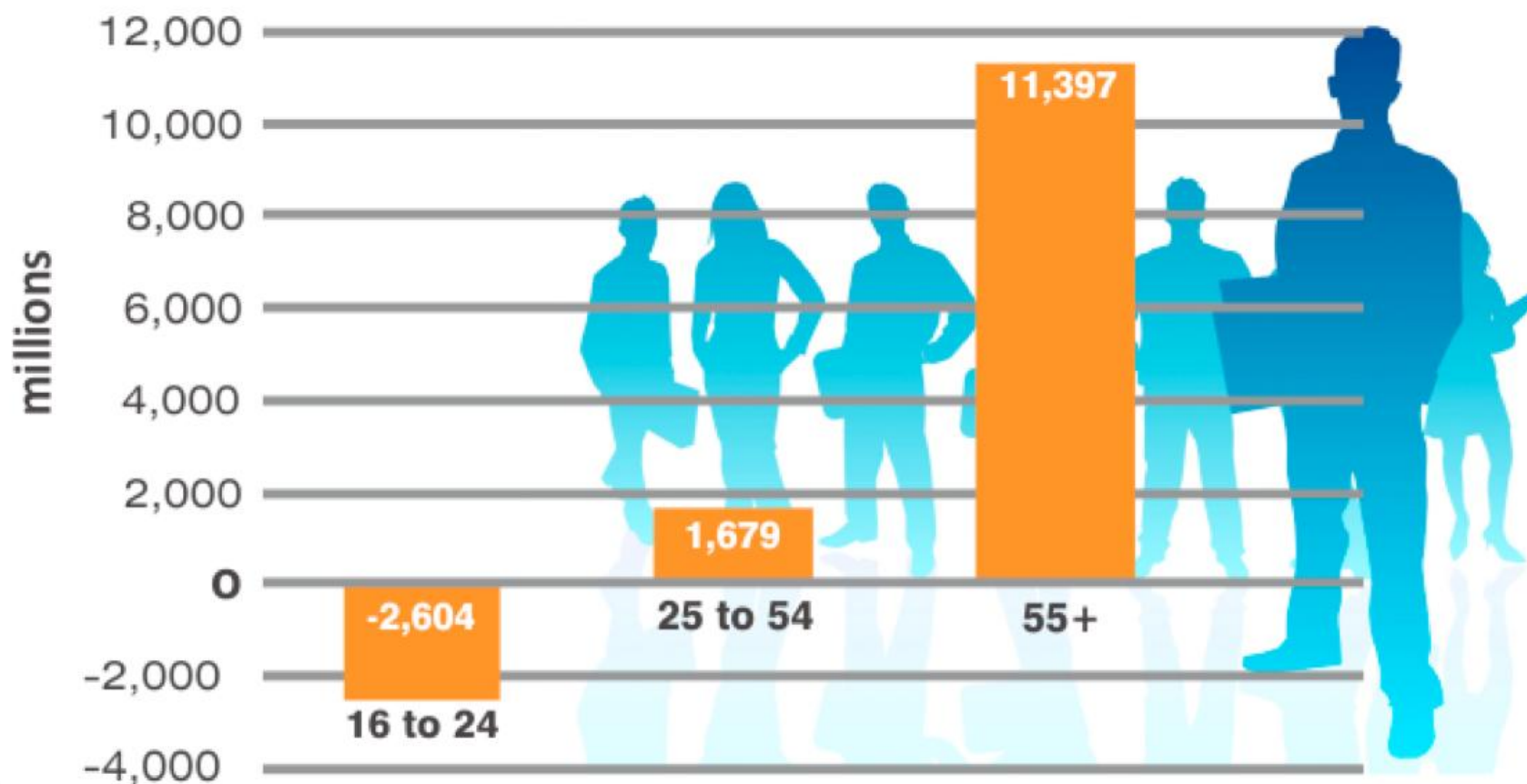


Using these e/Tablets, patients fill out a survey of 88 questions, rating their symptoms on a scale of one to 10—nonexistent to severe—in the waiting rooms.



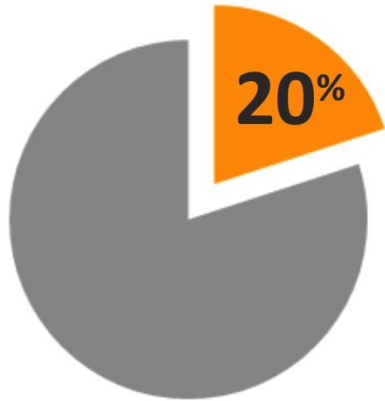
Work

Change in the Size of the U.S. Labor Force by Age Cohort 2010 to 2020

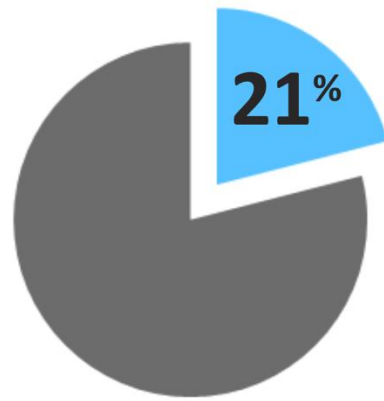


U.S. Bureau of Labor Statistics

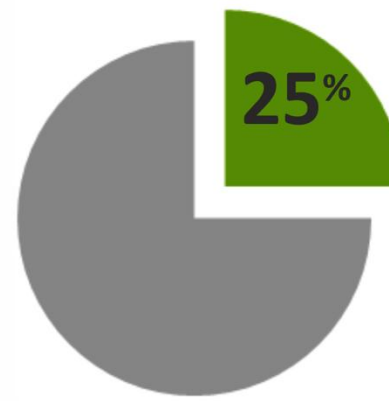
Proportion of older workers by sector 55+ (2010)



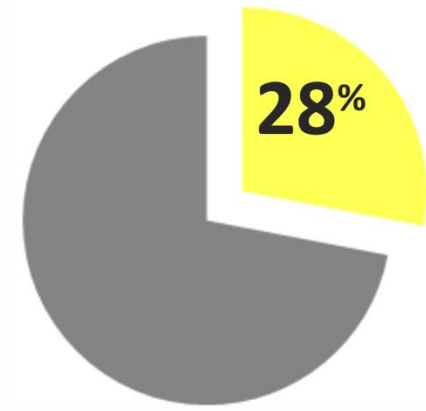
total **professional & business** workers 55 years or older



total **healthcare** workers 55 years or older



total **education** workers 55 years or older



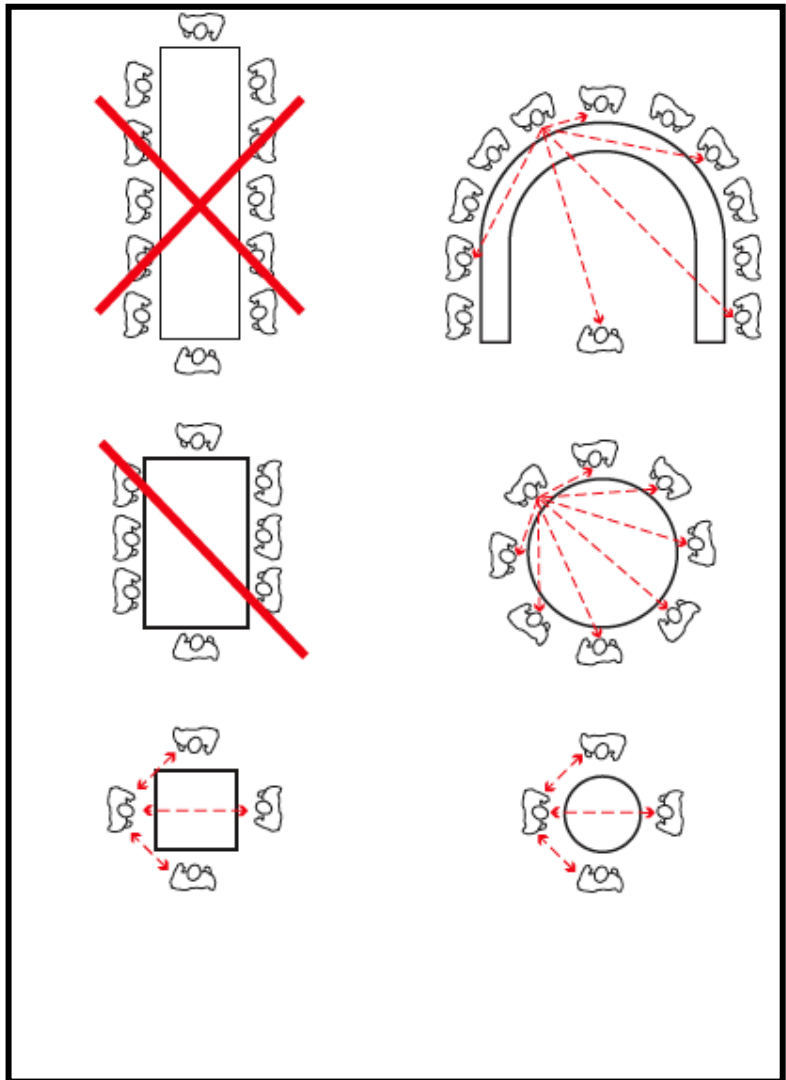
total **public administration** workers 55 years or older

Neeta P. Fogg & Paul E. Harrington
Center for Labor Markets & Policy, Drexel University



Gallaudet University's **Deaf Space Design Guidelines**

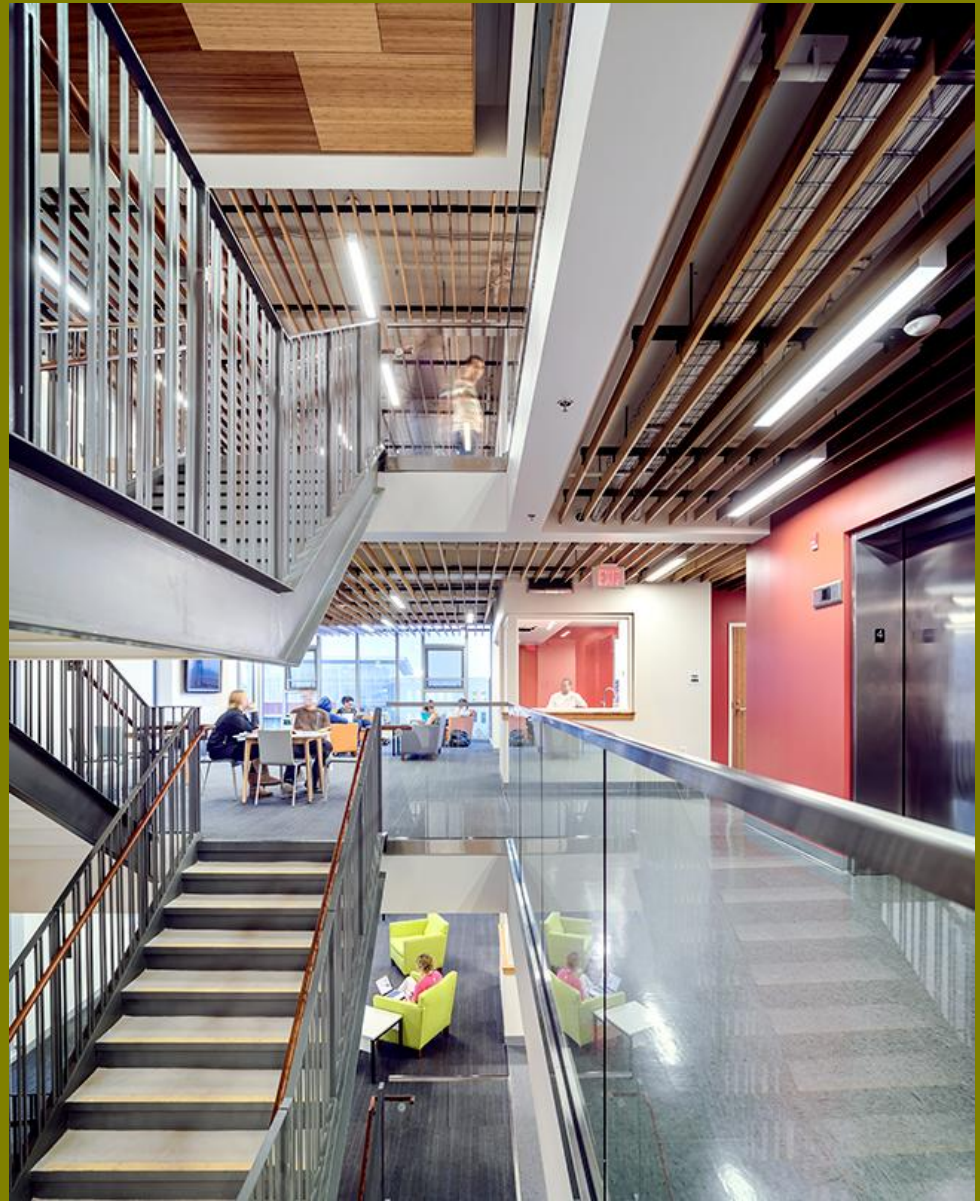
Volume I (DRAFT) © Hansel Bauman Architects





New Residence Hall 2013

First to incorporate Deaf Space Guidelines



Culture

St. Martin-in-the-Fields, Trafalgar Square, London

Every performance space is audio looped



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Earphone Guide @ Kabukiza Kabuki Theater (2013)

Two channel options: Guide for context & Script for narrative



Fire alarm firm in Tokyo creates scented fire alarm.

Tests at the Shiga University of Medical Science have shown that virtually all the hearing-impaired people exposed to the odor of *wasabi* woke up within two-and-a-half minutes.

Japanese Invent Silent Wasabi Smoke Alarm

BBC 3/3/08 Smelly but silent smoke alarm Japanese scientists have invented a fire alarm with horse radish waking people up without making a sound.



Products

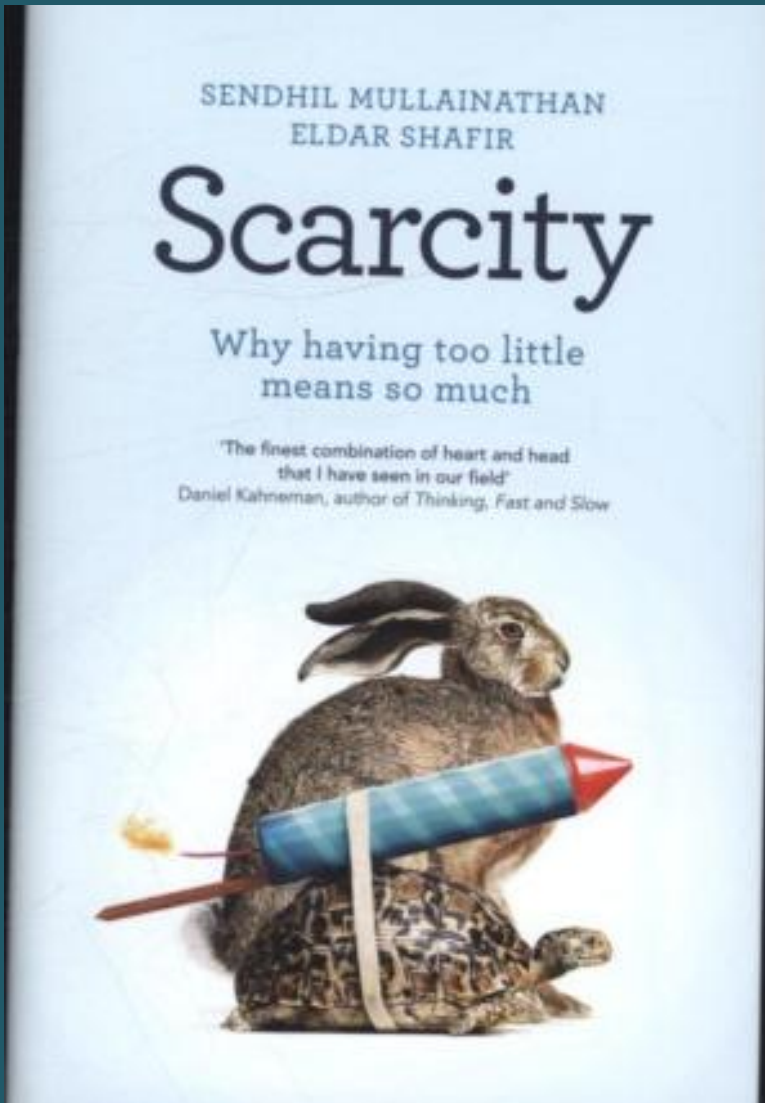
How design for people with disabilities and mainstream design could inspire, provoke, and radically change each other.



Godisa Solar Aid hearing aid

- The Solar Aid, invented in 1992 in Botswana
- Solar-powered hearing aid that costs less than \$40
- Godisa, a nonprofit, only maker of hearing aids in Africa and has staff members with hearing impairments.

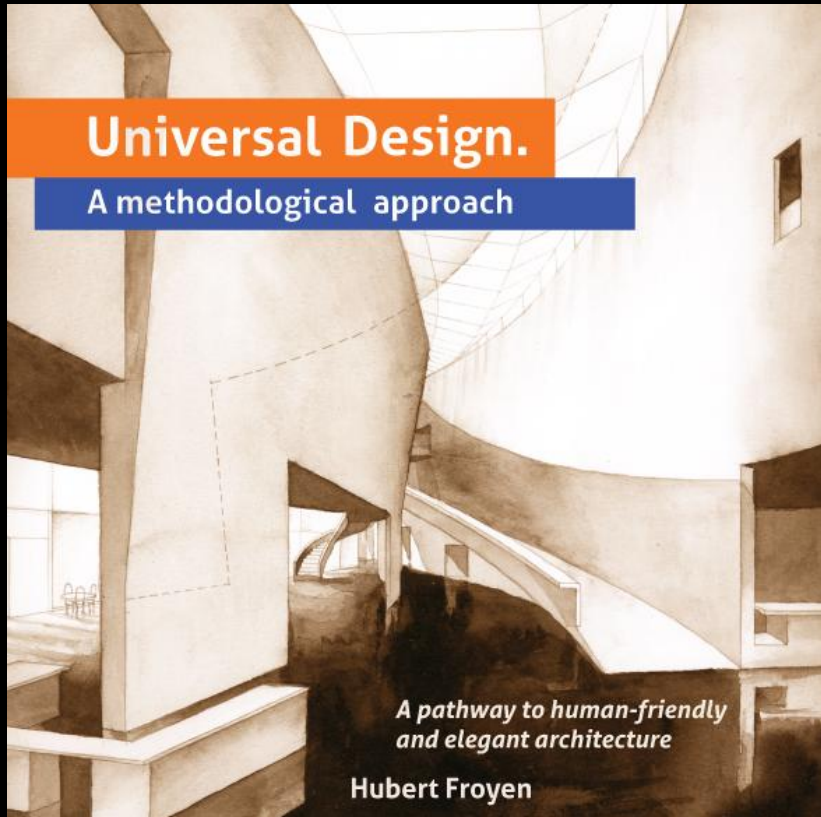




The authors, an economist and a psychologist suggest that scarcity of any number of things – money, time, attention – challenge our “bandwidth.”

Bandwidth basically means how much of our mental capacity is available to us at a given time.





Radical reversal of focus
from person to environment

‘universal’ refers to human
diversity and to a radical
human-oriented approach
(*user-centered*), and

‘design’ appeals for
extremely creative and
qualitative design solutions
founded on empirical
investigation (*evidence-
based*)”