Healthy Environments through Architecture: Wrestling with Capacity

UIA – IFHP UTC5

Ray Pentecost, DrPH, FAIA, FACHA, LEED AP

Ronald L. Skaggs and Joseph G. Sprague Chair of Health Facilities Design Director, Center for Health Systems & Design, Texas A&M University

2020-2023 Director, UIA – Public Health Group
Design for Health

Poised

Health and Medicine is now an information technology. ¹

Ray Kurzweil

Design for Health Determinants

**Influences**

Design touches all 5 areas

<table>
<thead>
<tr>
<th></th>
<th>Behaviors</th>
<th>Social Circumstances</th>
<th>Environment</th>
<th>Genetics</th>
<th>Medical Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHHS (Total, 1980)</td>
<td>50%</td>
<td>___</td>
<td>20%</td>
<td>20%</td>
<td>10%</td>
</tr>
<tr>
<td>McGinnis (Early, 2002)</td>
<td>40%</td>
<td>15%</td>
<td>5%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>Booske et al (Total, 2010)</td>
<td>30%</td>
<td>40%</td>
<td>10%</td>
<td>___</td>
<td>20%</td>
</tr>
</tbody>
</table>

Design for Health Stages

**Data**

**Proliferation**

- New sources
- Continuous
- Overwhelming
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Tipping Point

By 2020: Medical knowledge will start DOUBLING every 73 days!¹

¹ 20/20 Vision: Curriculum Renewal Project, University of Iowa healthcare, 2012.
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Tipping Point

Physician Currency

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Tipping Point

By 2025:

The **Trillion Sensor** economy

Internet of Everything

100 billion connected devices

Dozen+ sensors EACH

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2 Singularity Hub, May 19, 2015
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Tipping Point

Patients

300 million books
personal data EACH individual

2 https://www.freeimages.com/search/books-on-shelf
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Ray Kurzweil: By the 2030s we will connect our neocortex, the part of our brain where we do our thinking, to the cloud.

First graders today...

New Medical School?

Ray Kurzweil predicts that the Singularity will take place by 2045, AI Business, https://aibusiness.com/ray-kurzweil-predicts-that-the-singularity-will-take-place-by-2045/, March 17, 2017
# Design for Health Stages

## Data

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<td>New analytics</td>
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<tr>
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<td>Integrated</td>
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<td>Overwhelming</td>
<td></td>
<td>Powerful</td>
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*Design impacts health. / Research improves design.*
Design for Health

**Capacity**

**Story:** Building the next generation computer

**Goal:** 1 million X faster than today’s fastest

His friend has 10 years of social data...

Calculation: 1 million years using today’s fastest
# Design for Health Stages

## Data

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<tr>
<td>New sources</td>
<td>New analytics</td>
<td>New insights</td>
</tr>
<tr>
<td>Continuous</td>
<td>Integrated</td>
<td>Limited utility</td>
</tr>
<tr>
<td>Overwhelming</td>
<td>Powerful</td>
<td>Overwhelming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Artificial Intelligence</td>
</tr>
</tbody>
</table>

*Design impacts health. / Research improves design.*
Design for Health

Capacity

Artificial intelligence strength:

Patterns and statistical probabilities.

Common weakness:

The WHAT without the HOW/ WHY
# Design for Health Stages

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<td>Overwhelming</td>
<td>Manageable</td>
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- **New sources**
  - Continuous
  - Overwhelming

- **New analytics**
  - Integrated
  - Powerful

- **New insights**
  - Limited utility
  - Overwhelming

- **New value**
  - Strong utility
  - Manageable

- **Artificial Intelligence**

- **Augmented Intelligence**

- **Interdisciplinary Design Tool**

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*Design impacts health. Research improves design.*
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**Design**

Augmented intelligence:

**Intelligence**

Takes the 29 hour Watson “digest” and sorts it by what you need.

Connections will matter

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1 R. Stanley Williams, Professor, Electrical & Computer Engineering, Hewlett Packard Enterprise Company Chair Professor
Design for Health

*Design* UNC  1000 patients

*Intelligence*

Watson

Watson identified a treatment ...for 30% of the patients!

Ned Sharpless, MD, UNC Chappel Hill

Imagine such guidance on **Designing for Health**!

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Design for Health

Poised...

to manage challenge of CAPACITY

Thank You!

https://unsplash.com/s/photos/breaking-wave