Toward a Model for Collaborative Gerontechnology: Connecting Elders and their Caregivers

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Outline

- Gerontechnology
  - Definition and Concepts
  - Domains and Five Ways
- Gerontology
  - Activity Theory, Competence, and Environmental Press
  - Human Model, Person-Environment Perspective
- Cognitive Psychology and Social Network
  - Multiple Intelligence Theory
  - Social Network Theory
- Collaborative Gerontechnology
Gerontechnology

- Term coined by Jan Graafmans
  - Eindhoven University of Technology
  - 1989
- Design and development of techniques, products, and services
- Support healthy aging
  - Physiological and medical aspects
  - Psychological and social issues
- Called Gerotechnology sometimes.
Concepts

- Technological development drives society
  - Support human communication
  - Target technology to include elders
- Enhance technological environment
  - Compensate for age-related differences
  - Goals and functioning of elders
- Control of technological environment
  - Technology-assisted tasks
  - User interface
# Gerontechnology Support

<table>
<thead>
<tr>
<th>Domain</th>
<th>Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health and Self-Esteem</td>
<td>Physical, cognitive, emotional support.</td>
</tr>
<tr>
<td>Housing and Daily Living</td>
<td>Independent, safe daily living tasks.</td>
</tr>
<tr>
<td>Mobility and Transport</td>
<td>Move, get around - car or public transportation</td>
</tr>
<tr>
<td>Communication and Governance</td>
<td>Connect with others. Remotely monitor health.</td>
</tr>
<tr>
<td>Work and Leisure</td>
<td>Continue work. Learning and recreational activities.</td>
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## Five Ways

<table>
<thead>
<tr>
<th>Way</th>
<th>Tasks</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention &amp; Engagement</td>
<td>Monitor, habits, intervene</td>
<td>Fall prevention, nutrition, train</td>
</tr>
<tr>
<td>Enhancement &amp; Satisfaction</td>
<td>Support work &amp; hobbies</td>
<td>Virtual reality, enhance comm.</td>
</tr>
<tr>
<td>Compensation &amp; Assistance</td>
<td>Support motor activities</td>
<td>Mobility aids, assistive tech.</td>
</tr>
<tr>
<td>Care Support &amp; Organization</td>
<td>Lift, move, monitor meds</td>
<td>Ergonomically-designed equip.</td>
</tr>
<tr>
<td>Research</td>
<td>Measure, analyze physio.</td>
<td>Med. imaging, non-invasive.</td>
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</table>
Activity Theory

- Early 1960s – transformation in attitudes
- Theory of life span development
- Stimulation supports healthy aging
- Encourage appropriate activities
- Engage elders
- Maintain health and connections
Competence

- Personology
  - Murray’s theory of personality
  - 1938
  - Well-being when needs in equilibrium with environmental demands

- Competence model
  - Current level of capabilities and needs
  - Mediate environmental impact
Environmental Press

- Potential impact on behavior – specific feature
- Modify environment
  - Slightly higher than adaptation level
  - Provide stimulation
  - Not so high as to challenge individual competence
- Reduce environmental press
  - Compensation
  - Assistance
- Increase environmental press
  - Positive stimulation
  - Enhancement and satisfaction
# Human Model

<table>
<thead>
<tr>
<th>Layer 4: Interactions with others and situations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 3: Cognitive functioning</td>
</tr>
<tr>
<td>Layer 2: Physical skills, activities and performance</td>
</tr>
<tr>
<td>Layer 1: Physiological Functioning</td>
</tr>
</tbody>
</table>
Person-Environment

- Kurt Lewin
- Equation in social psychology
  \[ B = f(P,E) \]
- Prevalent gerontology model
- Environment changes as person ages
  - Obtains what requires from environment
  - Controls aspects can manage
  - Adjusts to conditions unable to change
Environmental Impact

- Person-Environment (P-E) Model
- Delineate aspects
  - Natural/physical environment
  - Built/man-made environment (includes technology)
  - Social environment
- Age-related physiological and behavioral changes impact P-E interface
- Environmental changes impact P-E interface
Multiple Intelligence Theory

- Howard Gardner
- 1983
- Evidence-based
- Eight (or more) separate capacities
- Individual variation
- Inborn
- Developed over time

- Linguistic
- Logical-Mathematical
- Spatial
- Bodily-Kinesthetic
- Interpersonal
- Intrapersonal
- Musical
- Naturalist
Social Network Theory

- Variety and type of resources important
- Social network changes over time
- Need different types of support
- Different relationships
- Connections more important than numbers of people
- Support from network more than dyad
Online Communities

- Encouragement and jokes
- Searching questions and personal advice
- Information and facts
- Community building
- Self-disclosure
- Tangential conversations
Collaborative Gerontechnology

- Situate communication in social network
- Group of stakeholders work together
- Common goal
- Interactive process
- Shared rules, norms, and structures
- Collaborative technology
- Coupled with gerontechnology
## Summary

<table>
<thead>
<tr>
<th>Layer</th>
<th>Theory</th>
<th>Way</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social (4)</td>
<td>Social Network</td>
<td>Care spt, Enhance.</td>
<td>Collab soc. networks</td>
</tr>
<tr>
<td>Cognitive (3)</td>
<td>Multiple Intelligence</td>
<td>Compens., Enhance.</td>
<td>Multimedia present.</td>
</tr>
<tr>
<td>Physical (2)</td>
<td>Person-Environ.</td>
<td>Prevention</td>
<td>e-learning, fitness</td>
</tr>
<tr>
<td>Physiological (1)</td>
<td>Activity</td>
<td>Compens., Research</td>
<td>Imaging, measure.</td>
</tr>
</tbody>
</table>
Thank you

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