



Exploring Human Computer Interactions Issues for Older Novice Users

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Outline

- Introduction
- Older Novice Population
- Research Areas
- Documented Problems
- Proposed Solutions
- Future Work
- Conclusion
- References & last word



First...

- Introduction
- Older Novice Population
- Research Areas
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Introduction

- World populations are skewing older
- Internet is becoming essential
- Older users have barriers to computer use
- HCI designs can address needs of older and novice users



Next...

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Older Novice Population:

- “older” undefined, often over 55
- “novice” undefined, range of illiteracy and technophobe
- U.S. Census, 2009: 42% no computers over 55



Next...

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Research Areas page 1/2

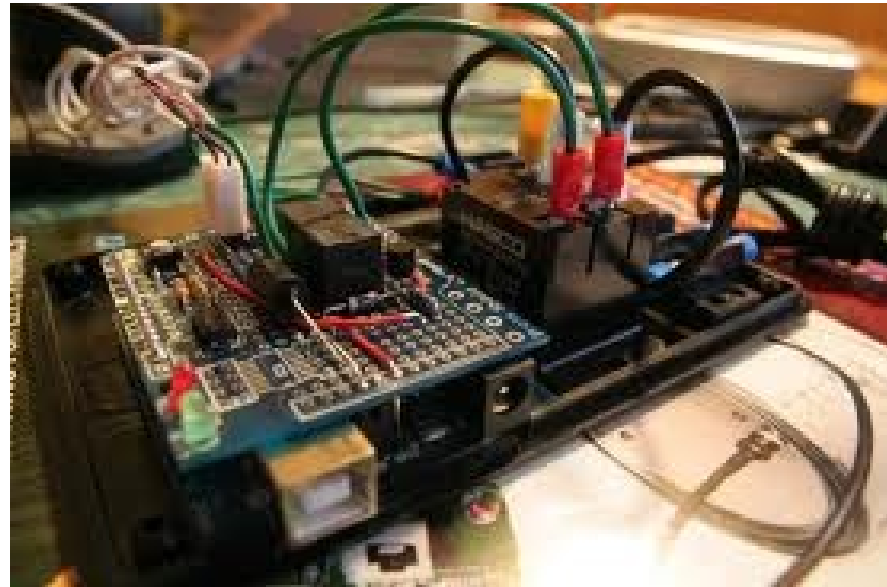
- Categorizing the population
- Understanding the limitations
 - Medical
 - Psychosocial
 - Cultural
 - Motivational
 - Attitudes
 - Existing Design



Research Areas

page 2/2

- Proposed solutions
 - Hardware
 - Software
 - Interface
 - Training
 - Attitudes



Missing Research Area



- Benefits of Computer
- Why internet?
- Why computer?

Next...

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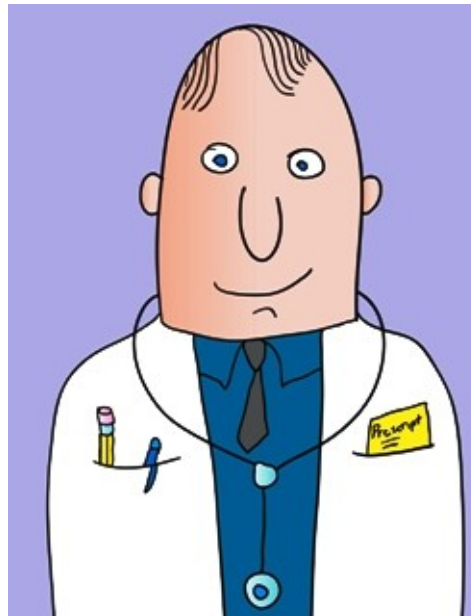


Barriers
Problems
Limitations

Oh so many...

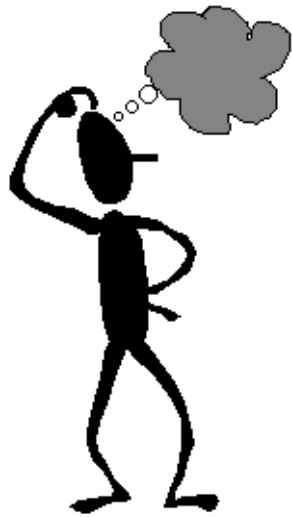
Build a User

- Story of a universal older novice user
- Meet Dr. Penny, MD: age 61, smart, computer illiterate



Limitations: Physical

page 1/4



- Cognitive decline is sub-clinical (seem normal and unimpaired)
- confusion
- Fluid memory loss affects navigating and the unfamiliar
- Vision and hearing changes

Limitations: Physical

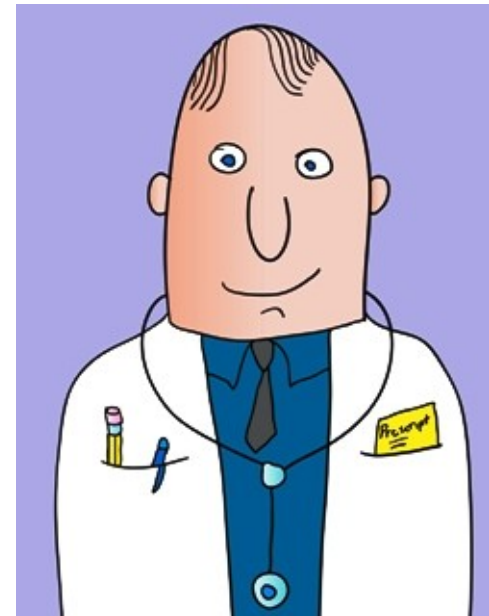
page 2/4

- Decision making confidence declines
- Eye-hand coordination
- Arthritis and tremor affect manual dexterity



Dr. Penny – physical limits

- Invisible (sub-clinical) decline: confusion when navigating and multi-tasking
- “What?” says Dr. Penny, “I didn’t hear you.”
- “The mouse won’t line up!”



Limitations: Physical page 3/4



- Loss of inhibition
- Unable to ignore irrelevant information
- Confusion between relevant and irrelevant

Limitations: Physical page 4/4

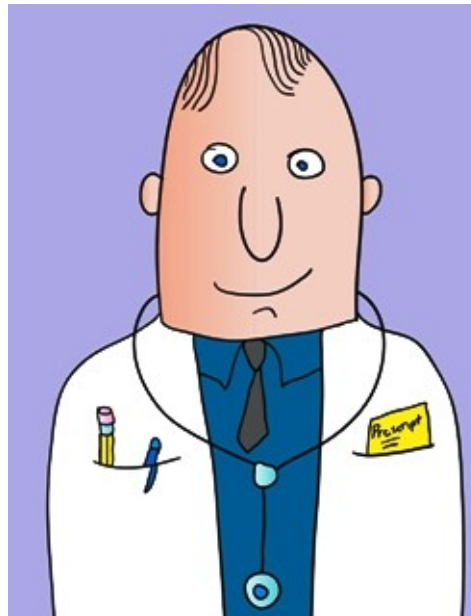
Daily variations from hour to hour due to:

- Eyestrain
- Bereavement
- Drug regimens
- Tiredness
- Previous illness
- Distraction
- Other stressors



Dr. Penny – daily limitations

- “Don’t tell me what to do, just show me”
- “The scroll bars are a different color on this webpage, is that OK?”



Limitations: Concepts page 1/2



- Conceptual models unfamiliar
- No match with real world
- For example: where is remote control to change the internet?

Limitations: Concepts

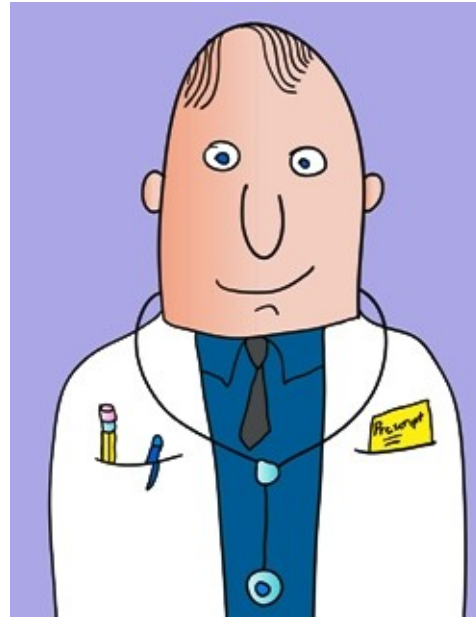
page 2/2

- Acronyms and metaphors
- Where does search engine go to look “it” up?
- Disconnect and clutter of web pages

The screenshot shows the CNN website homepage with a red header. The navigation bar includes links for Home, Video, NewsPulse, U.S., World, Politics, Justice, Entertainment, Tech, Health, Living, Travel, Opinion, IReport, Money, and Sports. The main content area is divided into several sections:

- Rebel leader calls for no-fly zone; bounty offered for him**: A photo of a man in a suit with a caption below it.
- Artists sing blues over Libya scandal**: A photo of a woman singing into a microphone with a caption below it.
- U.S. Muslims under scrutiny**: A section with a red and white graphic and a caption about Islam becoming a key issue for the GOP.
- Don't miss**: A section with three small images and captions: "Will iPads drive cars of the future?", "Hiding population: tough to count", and "Cowell: This 'idol' better than last".
- Other news**: A list of various news items including "Southeast storm: 38 seconds of hell", "Shuttle Discovery ends final mission", and "NPR CEO Vivian Schiller resigns".
- Advertisement**: A green advertisement for "GambleResponsibly.org" featuring three dice labeled "DEBT", "DIVORCE", and "BANKRUPTCY".
- User Profile**: A section for a user named "Hi there!" with a "Log in | sign up" button and a "FRIENDLY ACTIVITY" section.
- Footer**: Includes "NEWSPULSE" and "LOCAL WEATHER & NEWS" sections.

Dr. Penny – conceptual limits



- “How do you turn this thing on?”

Limitations: Attitude

page 1/2



- Anxieties, resistance, reluctance
- Fear of looking or being stupid
- Frustration, error shame
- Fear of failure, easier to quit
- Inexperience
- Confused by change

Limitations: Attitude

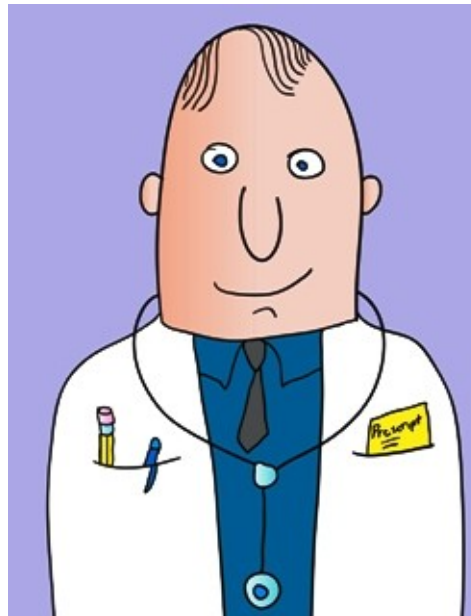
page 2/2

- Internet not marketed to older people
- Only hear about fraud, theft, scams and viruses
- Fears for privacy



Dr. Penny – attitude limits

- “I don’t need the inter-whatsy!”
- “It’s full of perverts and rip-off scams.”



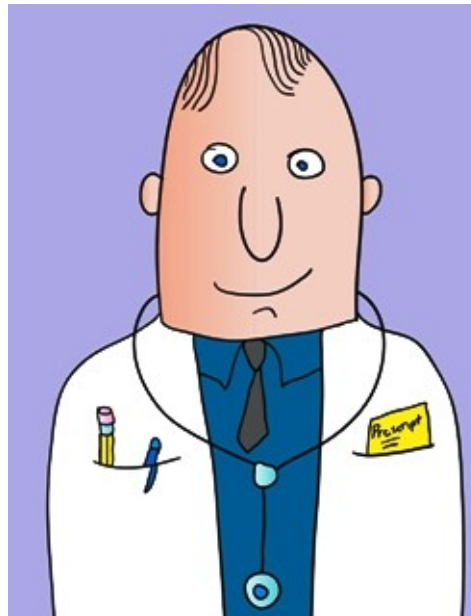
Limitations: Psychosocial

- Money
- Education level
- Missing motivation
- Lack of Interest
- Physical remoteness from internet provider
- No time or no teacher for learning



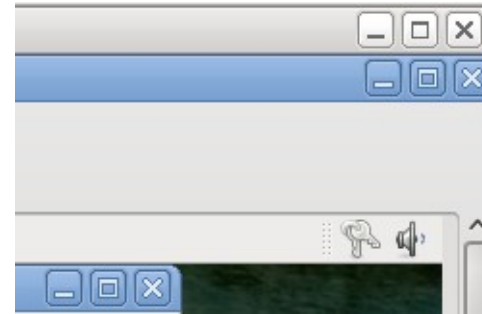
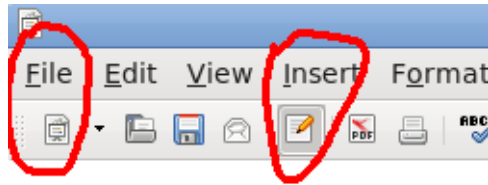
Dr. Penny – psychosocial limits

- “It costs how much?! Every month? Just to send an email?”
- [muttering] “Wasting time holed up in their room”



Limitations: Interface Design

page 1/2



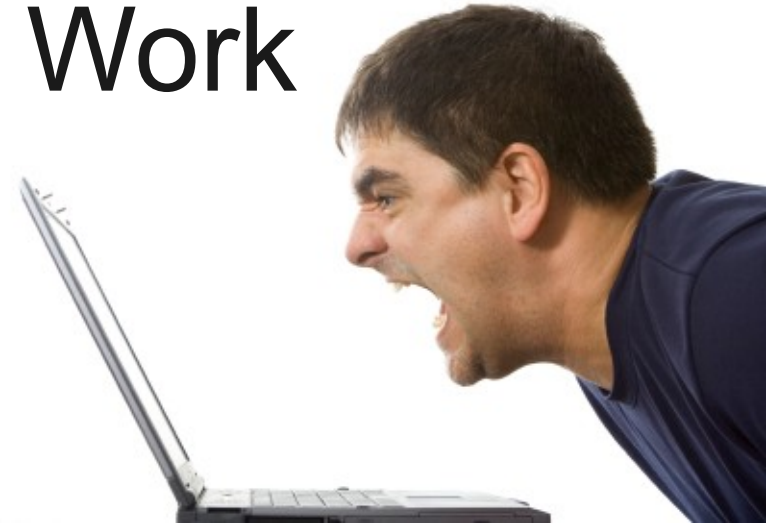
- Menus look like they refer to buttons
- “X” to close document closes application instead
- Scroll bars are obscure and scrolling up arrow makes page go down
- Multiple ways to do same thing: confusion!

Limitations: Interface Design page 2/2

- Selecting before doing command: e.g. copy
- “undo” only works in app, not across operating system
- Overlapping windows: where did work go? How to control which one is selected
- Where are files stored?
- Each application looks different



Limitations: “Lost” Work

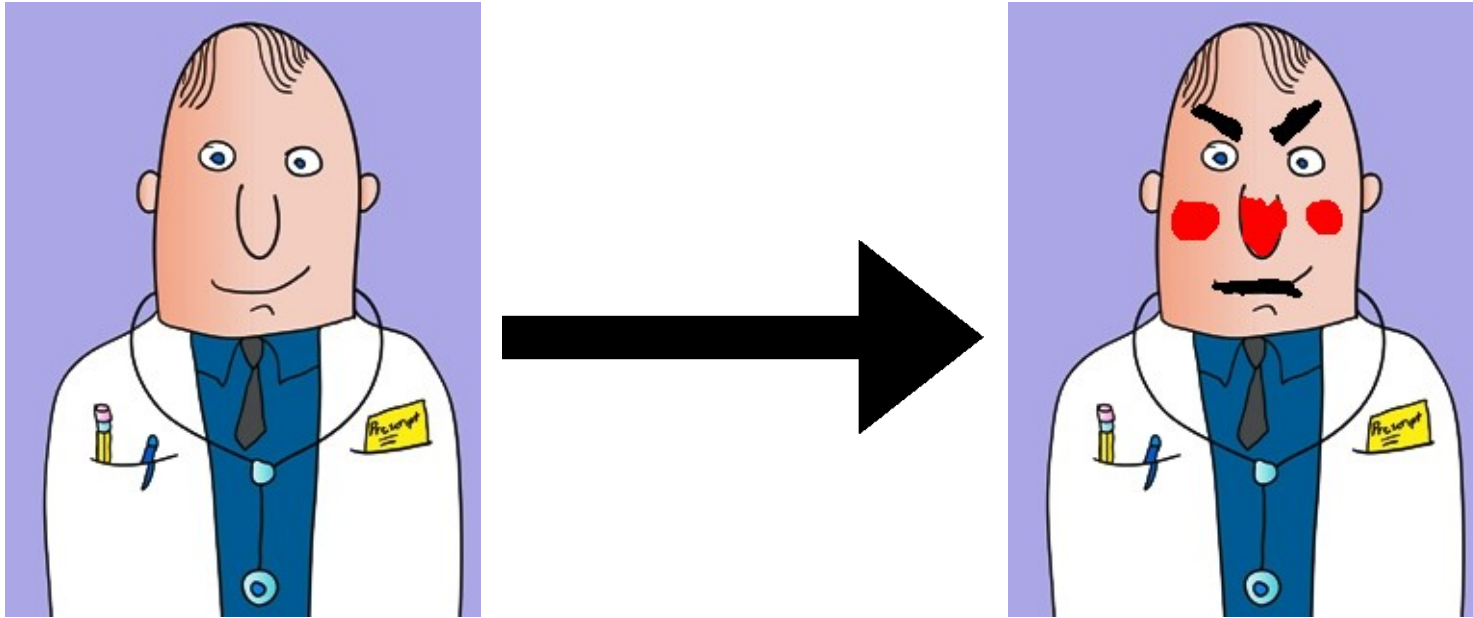


Crush any confidence!

How is work “lost”?

- Overlapping windows or pop ups in way
- Leaning on space bar or return
- Clicking minimize button
- Opening new program or window on top
- Panicking & random clicking of pop ups

Dr. Penny – interface design



- “Now I’m just plain angry.”
- [muttering] “But it was just there and now it’s completely gone!”

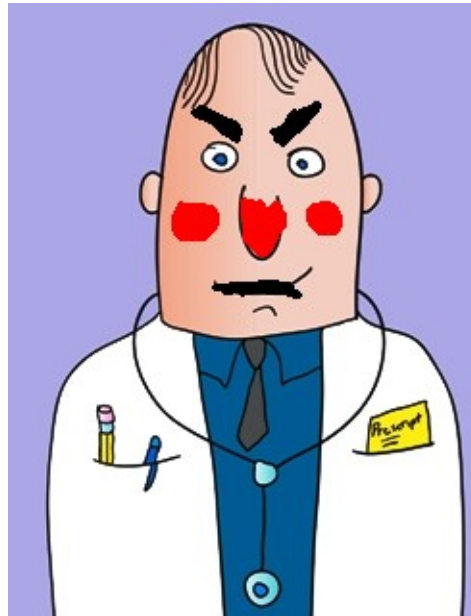
Limitations: Hardware

WIMP (windows, icons, menus, pointers) hard for so many reasons

- Mouse double click, click and drag too difficult
- Which mouse button and when
- Pop up menus are a surprise, why in the middle
- Qwerty keyboard is illogical
- Looking down at keys or mouse don't notice screen response/non-response

Dr. Penny – hardware limits

- [to himself] “Hmm, push this one, no, that one. Wait, what’s this now?”
- “I’m not a monkey! I can’t look at the screen AND the keyboard.”



Limitations: Internet

page 1/2

Internet is:

- Transient, changing
- Distracting with information at every edge
- Flexible and nonlinear

EDITION: U.S. | INTERNATIONAL | MEXICO

Set edition preference

Sign up | Log in

SEARCH

POWERED BY Google

Home Video NewsPulse U.S. World Politics Justice Entertainment Tech Health Living Travel Opinion IReport Money Sports

updated 4:43 p.m. EST, Wed March 9, 2011

Make CNN Your Homepage

Rebel leader calls for no-fly zone; bounty offered for him

The head of the interim government in eastern Libya pleaded for the international community to move quickly to impose a no-fly zone over Libya. [FULL STORY](#)

Artists sing blues over Libya scandal

Beyoncé and others have come under fire for performing for Moammar Gadhafi's family. The stars find themselves in the middle of a political firestorm for doing what they do best: making money off their talents. [FULL STORY](#)

Mideast and N. Africa unrest

- Family helps Gadhafi stay in power
- Where would Gadhafi go?
- Opinion: 7 ugly options for U.S. in Libya
- Protest primer | Egypt | UAE | Bahrain

Other news

- Southeast storm: '30 seconds of hell'
- Shuttle Discovery ends final mission
- Columnist David Broder dies
- Budget bill protesters stand firm
- NPR CEO Vivian Schiller resigns
- TV exec sentenced in wife's beheading
- Seven kids die in farmhouse fire
- Ticker: Obama addresses rumors
- Cafferty: U.S. too reliant on handouts?
- Rep. King explains IRA support

U.S. Muslims under scrutiny

Islam becomes key issue for GOP Rep. Peter King's hearing on "Islamic radicalization" is the latest sign that critiquing aspects of Islam has become a staple of GOP rhetoric. [FULL STORY](#)

- Man behind hearings | Groups upset
- Opinion: Mosques as positive force
- Belief Blog coverage

Don't miss

- Will iPads drive cars of the future?
- 'Hidden population' tough to count
- Cowell: This 'Idol' better than last

Michigan Department of Community Health
M.D.C.H.
GambleResponsibly.org

DEBT DIVORCE DEMOTION

Hi there!
Log in | sign up

FRIENDS' ACTIVITY

View more friends' activity | What's this?

- Melanie J. Kueber shared Source: Former Mexican police chief is in the U.S. · 21 hours ago
- How the human penis lost its spines
2,979 people shared this.
- Website for those born this way
2,687 people shared this.

Facebook social plugin

NEWSPULSE

LOCAL WEATHER & NEWS

Limitations: Internet

page 2/2

Internet causes older user limitations of:

- Disorientation
- Loss of concentration
- Failure to comprehend
- Inability to track and remember disjoint pages
- Cognitive overload, can't ignore irrelevant
- “obligation to read” factor



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Solutions!

lots of them

Solutions: Familiar Controls

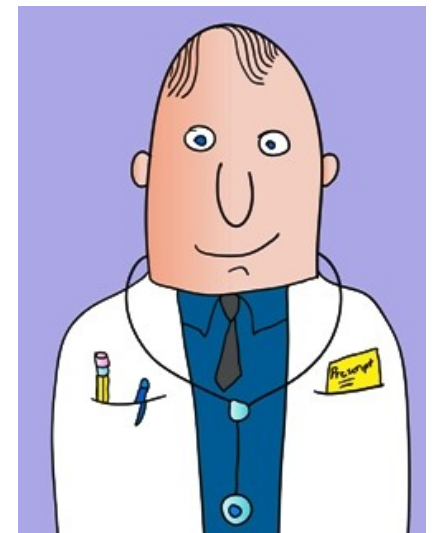
- Concept is familiar
- Physical action matches function



Solutions: Interface



- Empowering Seniors
- “Connecting Families”
- “You can’t make a mistake”

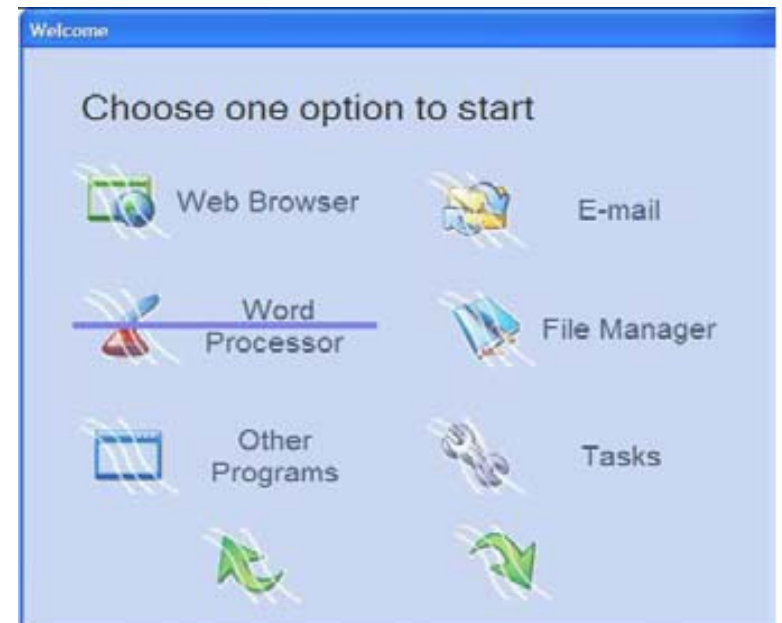


Solutions: Tangible Interface



- TUI: tangible user interface
- RFID tags shaped like envelope to open email
- JIVE:
 - plug and play router
 - Place a friend tag on the screen
 - Use betty to connect

Solutions: Pen Based Interface



- Pen used in 6 motions
- Crossing Paradigm
- Only for steady hands
- Relies on recall of pen motions

Solutions: Picture Menu



- Go Computer, \$800
- Function menus
- Review: menu choices?

Solutions: Website seniornet.org



- Bringing technology access and education to adults 50+
- Enrich their lives
- Enable them to share their wisdom

Solutions:

Voice & Gesture Recognition

- Touch screen
- Gesture on screen, gesture in air
- Voice recognition, talking web browser:
BrookesTalk



Solutions: Improving Visuals



- Reduce glare
- Improve color and contrast
- Large icons
- User controlled text size
- Font sans serif

Solutions: Promote Literacy

Some sample non-profits:

- The Digital Inclusion Forum (industry)
- Per Scholas (USA)
- International Development of Computer Education (Thailand, Ghana, Poland, Kenya, Peru, and Zimbabwe)
- Partnership for New Development (Japan helping Africa)



Solutions: Teaching

page 1/2

- Panic sheet
- Tips for helping

How to help someone use a computer.

Phil Agre

<http://polaris.gseis.ucla.edu/pagre/>

Computer people are fine human beings, but they do a lot of harm in the ways they "everything I've been taught about helping people use computers.

First you have to tell yourself some things:

Nobody is born knowing this stuff.

You've forgotten what it's like to be a beginner.

If it's not obvious to them, it's not obvious.

Be sure your “help” is helping

Solutions: Teaching page 2/2



What's wrong with method to left?

What's good about method to right?



Solutions: Expect in Future

- Hand held devices (small!)
- Touch screens, gesture & voice recognition
- Changing “look” of applications and web pages
- Constant change & everything online
- Universal Design, is it possible?

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Future Work: WHY?



- The forgotten research area: “why?”
- What motivation?
- What cost-benefit analysis?
- Individualism

Preliminary Reasons: WHY?

PRO Computer

- Information is power
- Computer literacy breaks poverty
- Privacy to explore anonymously
- Entertainment
- Connection

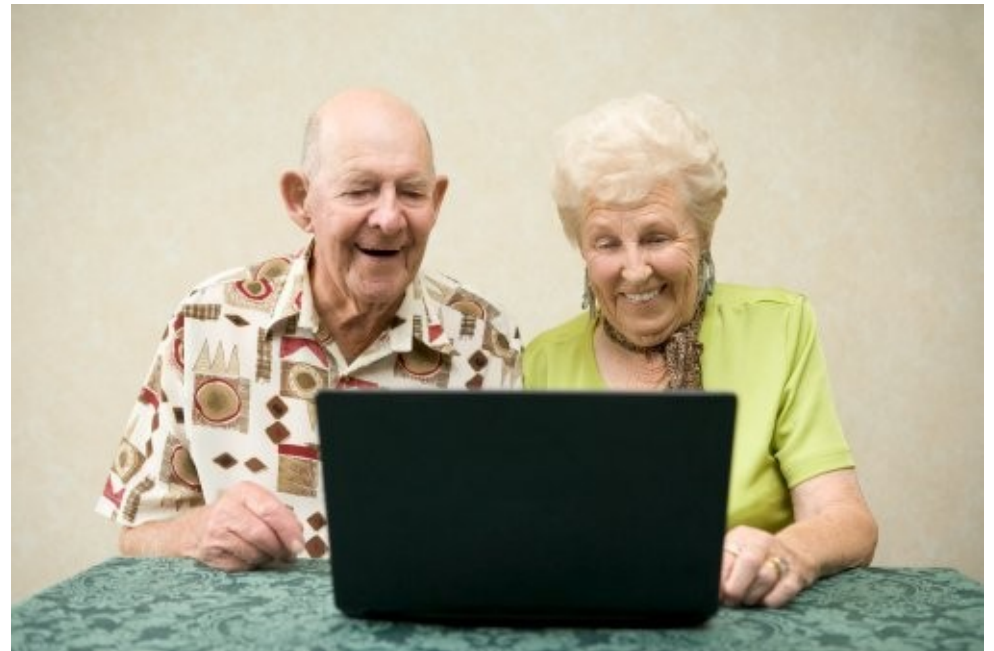


CON Computer

- Expense & bother
- Risks to privacy?
- Benefits of direct human contact: phoning and visiting shops

Benefits Motivate Getting Online

- News, photos, friends
- Sense of community & connection
- Feel positive attitudes towards aging
- Cost benefit
- Use builds familiarity & leads to comfort



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Conclusion: Older Novice Users

Even though...

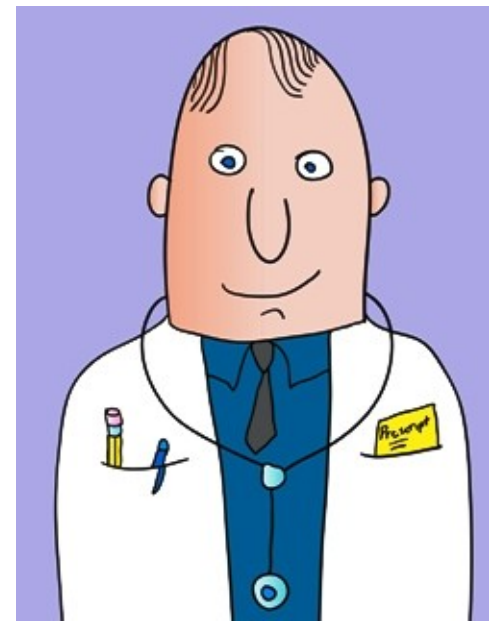
many documented limitations using computer

Also...

good reasons to bother

Maybe...

analogy to cars



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Really?

Old People Use A Computer: The Game Show

MORE  1,154 videos 



<http://www.youtube.com/watch?v=khhC5UkiNd4>

References

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- [16] M. Zajicek, “Interface design for older adults,” *Proceedings of the 2001 EC/NSF workshop on Universal accessibility of ubiquitous computing: providing for the elderly, New York, NY, USA: ACM, 2001*, pp. 60–65.
- [17] P. Zaphiris, M. Ghiawadwala, and S. Mughal, “Age-centered research-based web design guidelines,” *CHI '05 extended abstracts on Human factors in computing systems, New York, NY, USA: ACM, 2005*, pp. 1897–1900.

Internet Resources

page 1/2

U.S. Census:

<http://www.census.gov/population/www/socdemo/computer.html>

“We don't have a computer. Are we missing out?” (valid answer)

<http://www.guardian.co.uk/money/blog/2011/jan/28/do-we-need-a-computer>

“How to use your computer” (bad instructions with no pictures)

<http://www.easyc Computertips.com/article-howtouseyourpc-thebasics.html>

“Old people use a computer: the game show” on collegehumor (humor)

<http://www.youtube.com/watch?v=khhC5UkiNd4>

Jive: <http://jive.benarent.co.uk/index.html>

Internet Resources

page 2/2

“How to help someone use a computer” by Phil Agre (sensible teaching suggestions)

<http://polaris.gseis.ucla.edu/pagre/how-to-help.html>

David Letterman explaining that he doesn't need a computer, 2006 (humor)

http://www.youtube.com/watch?v=nw_oCDdIMms

User interface for older users (product)

http://bigscreenlive.com/content/How_It_Works.htm

Senior Net (service)

<http://www.seniornet.org/>

<http://www.youtube.com/watch?v=khhC5UkiNd4>



Thank you for listening.
What do you think?
Can you help an older novice user?



Make sure you ask before helping.