

# Notes for Aging Eyes Meet Shrinking Screens

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Slide #1

## welcome to the world of aging eyes and shrinking screens

I want to begin by asking you three questions:

1. How many of you use PDAs? Raise your left hand.
2. Who uses a cell phone to check e-mail? Raise your right hand.
3. How many of you need glasses OR CONTACTS to read those small screens? Raise both hands.

So... some of you already know what it means to have aging eyes in a wired world of shrinking screens.

After this presentation you will ALL know:

First...WHY DESIGNERS, DEVELOPERS, AND WRITERS SHOULD CARE ABOUT AGING EYES -- AND OTHER BODY PARTS! -- AND SHRINKING SCREENS

Second...HOW AGING AFFECTS THE WAY WE USE SMALL DEVICES

Third...PRACTICAL SOLUTIONS TO DESIGN, DEVELOP, AND WRITE FOR AGING EYES AND SMALL SCREENS

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Slide #2

## how old would you be if you didn't know how old you was?

- - - - *Satchel Paige*

[NOTE: Satchel Paige joined the major leagues at age 42. His long pitching career lasted 17 years, retiring at 59. He was elected to the Baseball Hall of Fame in 1971.]

- You don't have to be old to struggle to read the tiny type on your cell phone, iPod or PDA.
- As you rack up the birthdays, your vision diminishes, hearing fades, and fingers stiffen.
- Yet tech gadgets seem to be going in a direction that's bound to make the situation worse, with tiny keypads and tiny screens.

- At the same time, consumer-electronics makers keep adding enough features to confuse even the tech-savvy, let alone those who just want the device to work out of the box.
- On top of that, the makers of those gadgets target their advertising to young, tech-savvy trendsetters.

**But what about the rest of us? Does anyone care what we want, think, or spend our money on?**

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Slide #3

I'm Nova Berkshires from Sapphire Communications and I'm a certified usability analyst for Web sites. My co-developer on this presentation is Pat Cope, a marketing consultant for technology companies. She couldn't be here today, but her presence is in every word.

I'll begin with some background on our aging population and how it uses small devices. Then I'll describe some common physical failures as we age, and suggest some ways to make small devices user friendly for older people.

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Slide #4

Our concept of "old" has changed as people live longer and we see more older people among us.

- If you were high-school or college age during the rebellious Sixties, you'll remember the saying: Don't trust anyone over 30. Thirty now seems relatively young.
- Still, 30 is the first age when we jokingly claim to feel old. Top athletes are "old" in their 30s. Olympic gymnasts are "old" in their 20s. The first sign that I wasn't "*young* young" any more was when I could no longer pull all-nighters.
- The numbers we attach to age are losing their old meanings.
- Look at all the new terms for age -- "60 is the new 40," "the young-old," "third age."
- And look at all the products to put age on hold – exercise programs, vitamins, hair color, teeth whitening, liposuction, Botox, Viagra.
- There's no such thing as just being "old" any more.

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Slide #5

**so "old" is relative: but compared to what?**

65 is often the definition of old age in America because that's the full retirement age for social security benefits.

When the US social security system was adopted in 1935,

There were good reasons to make 70 the retirement age

But actuarial studies showed that using age 65 made better financial sense than using age 70

So using age 65 as a marker for old age has nothing to do with physical or mental abilities

Gerontologists consider age 75 a marker

Source: American Society on Aging

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Slide #6

### **look at aging through a new lens**

Thirty years ago, an article in the New York Times defined "older" as the young-old and the old-old, and those concepts are now widely used

(The rise of the young-old, by Bernice L. Neugarten, Jan 18, 1975, p. 24)

The two key points were that

1. The young-olds are physically and mentally vigorous and socially active
2. Older Americans are young-old until they lose their health, then they become old-old regardless of age

So some people are old-old at 60, and we probably all know someone who is still young-old at 80

While the general concept of defining age by health still holds,

Some translate that to age groups. One common grouping is

**Young-old** (65-74), **old-old** (75-84) and **oldest-old** (85 and older).

So it's clear that we can't put everyone over 65 in the same bucket.

But no matter how we define "old," the conclusion is the same: **Americans are aging robustly**

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Slide #7

### **global aging: it's a gray, gray world**

- The rest of the industrial world is aging even faster than the US.
- Until this century, the world-wide 65-and-older population never amounted to more than 2% to 3 % of the total. But as better health care helped people live longer, birth rates fell at an even faster rate. Quite simply, retirement systems got thrown out of balance. There just weren't

enough new workers to replace retiring ones and keep pension plans stable.

- Today, in the developed world, this older population amounts to 15%. By the year 2030, they will be around 25%. Italy, Japan and Spain are the most vulnerable, and by 2040 will have as many retirees as workers.
- Compared to nearly a dozen other developed countries, the United States is in relatively good shape. It's biggest challenge is rising medical costs.
- Because of global aging, governments around the world face mounting fiscal burdens, labor shortages that lead to immigration issues, and a host of policy and social issues. .
- If your company sells products and services internationally, global aging could affect your business long before age-related changes in the US economy do.

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### **the rise of the young-old: boomers on the brink**

[[Boomers were born in the years 1946 through 1964]]

- Right now, in 2005, we're in the middle of one of the greatest demographic shifts ever in the United States.
- Every single Baby Boomer is now 40 or over.
- The youngest, trailing-edge baby boomers turned 40 last year.
- The oldest, leading-edge boomers turn 60 next year.
- More than one-third of American adults (38%) are now 50 or older.
- When the baby boom generation turns 65 over the following decade, they will be the largest elderly population in the history of our country -- and one-quarter of the total population.

These dates are very close!

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Slide #9

### **get ready for the "seniors decades"**

- Boomers are a unique population segment, unlike anything the US (or the world) has ever seen.
- They grew up in economic boom times, and because of that, have a unique mind-set.
- Boomers have always done things in a big way, as activists and consumers.
- The leading edge Boomers fought for civil rights, the pill, and women's equality in the Sixties' Civil Rights Era, and became known as the love-one-another Woodstock Generation.
- By the mid-Seventies, the Vietnam War had ended, and disco was in. The trailing edge Boomers had not spent their impressionable teen years in the activist political Sixties of their older brethren. Instead, they led the

way to the Me Generation coined by Tom Wolfe. Though the battles were noisily fought in the 60s, the actual broad societal shifts occurred, quietly, primarily in the 70s.

- But regardless of their actual ages, the boomers will "get old" much later than any generation in history.
- They will not be the "senior citizens" of their parents' or grandparents' generations.
- Boomers are used to getting what they want, through activism or consumerism.
- They will be just as influential in their senior years, affecting how America looks, works, and shops.
- For many businesses--yours included--this means devising new ways to think about the senior market.

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Slide #10

### **scotoma: a blind spot**

Do you have a blind spot about the older market?

From a marketing perspective:

You may have a blind spot if you dismiss older users because you think they:

- Are set in their ways
- Don't want to learn anything new
- Buy only on price
- Are too brand loyal to switch

You may have a blind spot if you:

- Spend all your design, marketing and advertising dollars chasing the youth market when older markets might be interested in your products and have the money to buy them if you showed them some attention. (unless, of course, your product is uniquely designed for youths)

You may have a blind spot if you:

- Fail to research the specific product needs of the mature market.
- Sometimes it might take only small modifications to meet those needs.

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### **myopia: shortsightedness, not seeing the future clearly**

- That blind spot could lead to marketing myopia – a shortsighted view of the company's future.
- Let's take stock for a moment. We have two market segments, the traditional older population at one end and boomers at the other.
- The older population is big, it's getting bigger, and it's active and engaged with life.

- The younger boomer generations don't think of themselves as getting old, and will demand products to serve their needs as they age.
- And every boomer is already age 41-59.
- In short -- the older market is too big to ignore. Do I hear you thinking, "that's still in the future?"

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Slide #12

**i can see clearly now...**

let's add a new thought:

- Borrowing a product from the user interface field, let's put on our Magic Lenses™ and get another perspective of the older market.

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Slide #13

**every 7 seconds someone turns 50**

- Every 7 seconds! Think about it. Our session runs for 55 minutes, or 3300 seconds. While we're sitting here, 471 people are turning 50!
- Fiftieth birthdays hit some people hard. You know, half a century and all that. But fifty is also when people have major transitions in their lives, or will soon. Many adults have more life transitions after 50 than before.
  - They become empty nesters.
  - They become grandparents.
  - They start planning for retirement, volunteer work, hobbies, or leisure travel.
  - Many plan to keep working, or start a second career
- As if all that weren't enough, 50 is when the physical effects of aging start to appear, if they haven't already.
- **Vision. Hearing. Dexterity.**

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Slide #14

**rethinking 50+**

- Ten years ago there were 68 million Americans 50 or older.
- In another 10 years there will be 106 million. In just one generation, for every 10 people who turn 50 there will now be 15 who turn 50.
- By **[year x]**, 1 in 3 people in our country will be over 50. **researching year**

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- SLIDE: **there are lots of them...**

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## **rethinking 50+**

### **...again**

- So rather than thinking about clusters of seniors and boomers, maybe it makes more sense to think of an **aging continuum**, starting at around 50 and going until ... whenever.
- In this era of "**ageless aging**," individuals are going to choose where they want to be seen on that continuum, regardless of their actual ages!
- Marketers shudder at the thought of a huge, seemingly undifferentiated mass market when the mantra of the last two decades has been to "think niches."
- We'll all have to get creative, and segment customers by what they want and need, not by what we **think** they want because of their chronological years.

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Slide #17

## **what do we call them: seniors... mature... elderly**

- Let's stop for a moment and think about what to call our older populations.
- Boomers don't want to be called seniors, and neither do many people who
- I suggest the term "older." As a somewhat distant second choice, try "mature"
- They're fluid terms, and cover a range of ages and physical or mental abilities
- Neither is likely to offend your audience
- If you need tighter working definitions for sub-segments of the market, keep those internal to your organization

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Slide #18

## **older, wiser, wired**

- Older, wiser, wired...that's what the AARP calls those over 50 who use computer and communications technologies, and I think it's good enough to repeat!
- Let's look at some facts from the AARP and other sources about the wired older populations.

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## **older, wiser, wired**

72% own a computer

- Nearly three in four people ages 50 - 64 own computers. That's about the same level as under-50 ownership. Another 2 in 5 people over 65 own a computer.
- This was my first computer in 1986, my beloved KayPro II

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Slide #20

**older, wiser, wired**

nearly one-half use the web

Nearly half of the American population over 50 uses the Web

Source: Source: AARP, Bob Prisuta presentation, based on Scarborough Research, 2004

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Slide #21

**older, wiser, wired**

17% online over 10 hours a week

- 17% spend > 10 hrs/wk online
- That's more than a day's work. Well, maybe not for some of us!
- UCLA's Internet Report averages users across all ages at 11.1 hours a week.

Source: Source: AARP, Bob Prisuta presentation, based on Scarborough Research, 2004

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Slide #22

**older, wiser, wired**

39% buy online

- They're not just looking for information
- Many are still in their peak earning years, with lots of discretionary income
- They own 3 of every 4 financial assets in our country

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Slide #23

**older, wiser, wired**

53% own a cell phone

- More than half the 55+ group uses a cell phone, about 2/3 the rate of ownership among 18-34 year olds.
- With advanced technology and smart phones, they can use their phones to do everything from making a call to sending messages, reading a book,



and checking on their investments. Soon they'll be able to watch TV on the phone.

- With today's smart phones, they can take and send pictures. Since just about everyone has used a camera, this activity has great appeal. BTW, 24% of this age group owns a digital camera.
- But the mobile older people also want to keep in touch with their families, friends and colleagues. They travel and often live far away from grandchildren. They want cell phones they can read and use without doing brain gymnastics and finger Yoga.

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Slide #24

### **older, wiser, wired**

5% own a PDA

- A PDA is not a popular small device for the over-50 crowd, at just 5% ownership. That's about 1/4th of the ownership rate among 18-34 year olds
  - [Forrester Research 2004]
- But this number will increase as the 40-year olds turn 50 and PDAs become more than just organizers.
- Consider the original Palm organizer. It had a dimly lit screen, and a bit of a learning curve to master the special Graffiti handwriting to enter data. Not a good device for anyone with aging eyes or unsteady hands.
- Now called palmOne, the company offers models such as the Treo and Tungsten that have telephones, e-mail, cameras, even an MP3 player. They have tiny key boards, 320 x 320 pixel [can you translate this to a size, like 3x3 inches?] screens that use 65,000 colors, and built-in Wi-Fi antennas.
- Depending on the model, users can open Word, Excel and PowerPoint. These small devices can become a traveling office or friendly and useful companion...if they're easy-to-use.

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### **older, wiser, wired**

33% want cell phones & PDAs

- While about half of the over-50 group has cell phones, and a few have PDAs, another one-third doesn't yet have them, but wants them.
- What's keeping these millions of older people from buying small-screen devices? We know they are comfortable with computer technology.
- palmOne found that about one-third of customers over 50 are buying their first handhelds and smart phones. And palm has catered to their needs with easy-to-use devices and packaging

- For example, a new palmOne handheld comes with a setup poster that describes three steps, in large type with large pictures, in very simple language. In other words, the device is easy to use right out of the box.  
Source: "Tech tunnel vision, Gadget makers shortsighted in ignoring older

Americans by [Andrea Coombes](#), CBS *MarketWatch*

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### **older, wiser, wired**

65% of boomers stay current with technology

Few of the leading edge Boomers grew up with computers other than working with mainframes. But most have embraced technology, and report they are doing more to stay current than they did ten years earlier.

[The Boomer Project, 2003]

Younger boomers, now in their 40s, have lived with computers and technology gadgets much of their adult lives.

When you think about it, the older boomers got gypped on technology...

- They only got the microwave and answering machine!
- Their kids and grandkids got the small-screen fun stuff, like PDAs, cell phones, videogames, and iPods.
- Generation X (1965-1980) were the first to be computer literate
  - The Net Generation, born after 1980, were probably sending email by kindergarten, playing videogames, and downloading music from the Internet.
  - OLD: The Boomers will continue to grow their knowledge of technology.

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Slide #27

### **older, wiser, wired**

"i'm a boomer, too!"

Here's a fun fact. The modern computer is also a baby boomer.

- The electronic digital computer was born on St. Valentine's Day, Feb. 14, 1946, when ENIAC--the Electronic Numerical Integrator and Computer--was first demonstrated to the public at the University of Pennsylvania.
- It was funded during World War II by the U.S. Army to compute ballistics trajectories for field artillery.

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Slide #28

**the tech elite:**

heavy users

**[Pew Internet & American Life Study: The Demographics of Technology Users]**

Nearly one-third of the population (31%) are heavy technology users and early adopters of new technologies. Most would give up their TVs and land-line phones before their computers, Internet connections, or cell phones.

So says the Pew study on Internet use, whose focus is on how people select and use information products and services, whether online or offline. Here's how that tech elite breaks out:

1. Wired GenXers: 60%, average age 36
2. Young tech elites: 20%, average age 22
3. Older wired baby boomers, 20% of the tech elite, average age 52

This older wired group is mostly male, all have Internet access at home, and 4 of 5 have cell phones. They spend more money online than any other group: \$175 a month. Online use is high, especially for news and work-related research.

Other older users include what Pew calls low-tech and unwired boomers, though about half of each group uses the Internet and 3 in 5 have cell phones. Among low-tech elderly, Internet use is 12% and about 2 in 5 have cell phones.

A side note for you who write user manuals and help. A study last year on technology differences across generations likens boomers to the over-60 population. They are auditory and visual learners. When they get a new gadget, the first step is to read the manual. The GenXers and Net Geners are tactile learners. They just start to connect wires and push buttons. Manuals? Those are for the "old folks," they say.

While all of us have some blend of different learning styles, visual has traditionally been the predominant style for about 80% of the population, then audio, and tactile by only about 5%. It seems that growing up with a GameBoy in your hands develops the tactile learning.

<http://www.technostress.com/tnp45.htm>

The National Psychologist

**Understanding the Technological Generation Gap**

Larry D. Rosen, Ph.D.

*The National Psychologist*

March-April 2004

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Slide #29

**keep them wired**

The next generation of “older” people will be more wired than today’s “older” population. They’re wired now and they expect to stay wired.

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Slide #30

**predictable age changes**

Physical changes that come with advancing age affect how older people interact with computers and small devices.

I’m going to draw a rough sketch of some of the predictable physical changes that occur with age. The three major changes are to visual, physical, and cognitive abilities.

Then I’ll propose solutions.

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Slide #31

**aging eyes:**

presbyopia, color & light

Most people, by the age of 40- to 45-years, begin to recognize a loss of ability to focus on words and objects within reading range.

Presbyopia, which is Greek for aging eyes, means the eye loses its ability to see up close. You know you have this when your arms aren’t long enough to hold something far away enough to read.

You’ll remember that presbyopia is the inability to focus clearly on reading material at normal distances.

You also will want to know that about 10% of the male population is color blind and color as a communication tool does not always work, especially on small devices.

Color is either achromatic or chromatic. Achromatic colors include black, white and shades of gray. Test your sites in black and white to ensure they still function.

Chromatic colors are blue, red, green and yellow. The older eye sees them best in good light. Older people have more problems seeing in the blue spectrum and many do not see purple. As a rule of thumb avoid putting saturated red and blue together, or yellow, green and blue in close proximity.

Colors often appear darker and more yellow to the older eye.

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Slide #32

**aging bodies:**

arthritis, tremors, coordination

The older people get the more likely they are to have some arthritis. This can make dexterity with fingers difficult. Simple movements like pushing buttons, moving a stylus, or rolling a track ball can be slow and awkward.

Another common change for older people is having slight tremors in their hands. Writing with a pen or pencil may lose its flow and become jagged. Writing with a stylus may become difficult. It also becomes difficult to accurately press tiny keys on a small device keyboard especially with thumb-typing.

With aging, eye hand coordination also slows. Reflexes aren't as quick either.

Some coordinated movements with a small device may become awkward. For example, controlling a drop down menu selection, or getting the stylus placed in precisely the right position, may not happen quickly and smoothly, or at all.

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Slide #33

**aging minds:**

recall, memory & focus

As people age, some don't recall concepts and details as quickly as when they were younger. For example, they may forget how to follow instructions to find a contact, or send an e-mail with a cell phone.

In addition to losing rapid recall, the ability to stay focused on a subject may diminish. This may affect navigation and the recall of how someone got from one screen to another. Confusion results in frustration and an unwillingness to continue with a task.

One solution to minimize this is to have visited links change color so people will recognize pages they already visited.

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Slide #34

**solutions:**

what to do

Let's look more closely at how you can make small devices accessible and usable for people who no longer see or respond as well as they previously did.

A good place to start is by concentrating on what people want to do with those devices.

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Slide #35

**small devices:**

what users want to do

You won't be surprised about the top uses:

Phone calls are # 1.

1. E-mail and IM
2. Web surfing & browsing
3. Reading news
4. Hobby information
5. Entertainment information
6. Shopping & buying online
7. Medical information
8. Travel information
9. Tracking credit cards
10. Playing games

Source: The Digital Future Report, Annenberg

Some sources suggest searching for -health info is second to e-mail.

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Slide #36

**feature overload?**

Look at all the things small devices can do. When people go to buy one of these devices, the manufacturers and carriers emphasize the features.

All these features add complexity and make the devices hard to use.

Emphasis really needs to shift from features to what people want to do.

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Slide #37

**your job:**

simplicity & ease of use

Advances in screen technologies and operating systems are in development and will ultimately make small screen devices easier to use. But those are still a few years away.

In the meantime, it's your job to simplify tasks for the user.

Making small devices more usable for older users also benefits younger users.

Think about how removing physical curb barriers benefited parents pushing baby strollers. Everyone benefits from having easier access and use.

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Slide #38

**solutions:**

how to do it

Now I'm going to give you some solution tools.

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Slide #39

**have a process**

One of the best techniques for a small device project is to include the entire team from the outset. Include the writers, graphic designers and code authors, as well as your management sponsors and project leader.

Be absolutely clear about the audience's tasks and priorities:

- Research people, context and activity
- Use data to develop design mockups
- Test early and often with small paper prototypes
- Learn from mistakes
- Ask for comments continuously

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Slide #40

**the basics**

Begin with the basics.

Concentrate on the information

- Organize content into simple chunks (more about content writing later)
- Avoid large images, Flash, animation, and other multi-media bells and whistles
- Set fixed widths to < 160 pixels (some say as low as 120 pixels). Ideally use a percent rather than a pixel dimension.
- Use 256 colors saved as a .gif
- Forget frames, tables, image maps, and pop-ups
- Write clear alternative text for images

These suggestions are all based on proven best practices. Following them will improve the usability of your small screen sites.

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Slide #41

**the elements**

small devices use these common elements:

- Fonts
- Color
- Space

- Graphics
- Content
- Navigation
- Buttons, Stylus, Joy Stick ... keyboard maybe
- **WORDS**

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Slide #42

### **make text readable**

Whether it's a watch, a GPS device, caller ID on a standard phone, an ATM machine ... it's likely to look blurred to the 40+ eye.

One obvious solution is to make bigger small devices just like some telephones and clocks are jumbo sized.

One of the best solutions is voice recognition, already available. But many people do not want to pay for this option. They want to read the screen display ... even if they need their glasses to see it clearly.

Some small device experts recommend using Cascading Style Sheets and classes to control text display.

The alternative to CSS is HDML: handheld device markup language.

Whichever method you choose, do not use the HTML <Font> tag.

Most small devices only display text in small or medium size, and bold and normal. Stay away from italics because they're so hard to read on small devices.

Limit your text structure to two, or at the most, three sizes.

- Use black text on white background (avoid blue text)

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### **emphasize**

color contrast & combinations

The aging eye has trouble detecting color changes in the reds, purples and greens. But, it can more easily see changes in yellows and blue-greens.

Use brightness and color variation to improve contrast. If colors are in the same range, e.g., blues or greens, they are harder to differentiate. Think contrast!

Another way of thinking about color for older users is: Give them higher brightness levels to distinguish colors.

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Slide #44



## **think tiny and vertical**

Think of the screen size display area as about the size of a business or credit card:

- Protect prime real estate at screen top: Use a small logo and show top level navigation and a search box. Avoid splashy graphical banners ... they're a waste of space.
- Use top level navigation to link to another page with subset links
- Never design for horizontal scrolling (NOTE: horizontal scroll is called "crawling")
- Design one column layouts
- Plan for 16 rows and 24 characters per row on one screen
- Allow no more than 5 pixels for navigation bars
- Keep navigation simple with small icons, static menus and intuitive next steps
- Support fast downloads with small icons

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Slide #45

### **be brief**

Writing has two jobs. To be brief and to be bright.

You have limited real estate, so use headlines, labels and bullets to convey key points.

Write concise but complete chunks because you don't know how the reader got to this page.

- Research key words and use them effectively
- Illustrate or diagram processes rather than writing a descriptive narrative
- Number steps
- Write at a 6th to 8th grade level.
- truncate
- And, my mantra: Write in active voice, PLEASE!

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Slide #46

### **be bright**

When writing for the small screen, it's not enough to be brief. You also must be bright.

But how do you differentiate from your competitors when you have limited space for text and graphics, and maybe no color?

It's all in the writing. Write content to express a distinct personality, a voice, and a style: Make it sparkle and keep it crisp.

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Slide #47

**writing x**

If content is king on the big screen, it's exponentially more important on the small screen.

Think vertical

Obsess about brevity

Write with personality

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Slide #48

**aging eyes meet GREAT screens on small devices**

Let's wrap up.

Now you know more about the growing older population and some of the predictable physical changes that affect their ability to use small devices.

As our tech-savvy population ages, they will demand devices they can use easily.

Now you can help aging eyes meet great screens on small devices.

###

Slide #49

No script

Slide # 50

No script

Slide #51

No script

Slide #52

The End. No script.