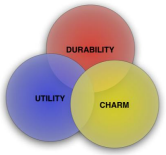
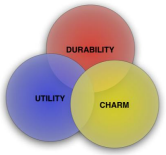


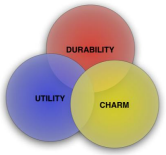
Class 7 CS545

Gregg Vesonder
Stevens institute of Technology



Roadmap

- Log book
- html5
- Interaction Styles
- To err is human
- The Project
- Readings this class: Norman Chapters 4 & 5; Stone et.al. Chapters 14-16
- Readings next class: Stone et.al. Chapters 20-23



Schedule

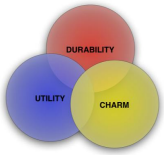
- ~~Labor Day, September 2nd – no class~~
- ~~Good, bad or ugly web site evaluation September 9th next class, in class~~
- ~~Project topic selection and team due September 9th~~
- ~~Tuesday, October 15th lecture class instead of Monday, October 14th~~
- Mid Term, October 21st in Moodle **no Hoboken Class**
- Project report every session in class starting Sept 16th
- moodle class November 25th
- Project reports Dec 2nd, Friday December 6th last day of classes
- Final on Moodle Dec 2nd – December 9th
- Missing schedules will result in grade deduction unless a prior arrangement has been made - I am flexible but …

Log Book

- Man marries video game character - http://news.cnet.com/8301-17852_3-10404956-71.html
- And then there is Hatsune Miku: http://singularityhub.com/2010/10/20/this-rocking-lead-singer-is-a-3d-hologram-video/
- William Gibson novel, Idoru
- ***THIS SUMMER I QUIT AUTO CORRECT***
- **YOURS?**

Entry 2: Oculus Rift

http://www.oculusvr.com/

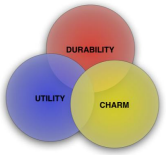


Entry 3: Wireframe Tools

- I use balsamiq, http://www.balsamiq.com/, it is pricey at about $80.

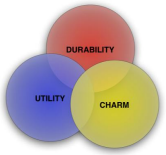
- A truly free tool is pencil, http://pencil.evolus.vn/Default.html
- A tool that is free now and this version will remain free while a more advanced version will be sold is moqups, https://moqups.com . I really like this tool the one I was trying to think of in class

- Finally a paid tool that I have not used but has great press is uxpin, http://uxpin.com. It has a free trial and is $14.99/user/month



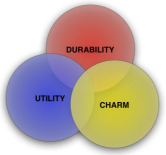
Current State

- Select topic, Target E's
- HCI development report
- Industry + questionnaire + ? data -> persona
- Begin first pass design – "eat your own dog food"
- Do PAR review of design – part of iteration
- Begin analysis plan (E related) for first user study
- Begin to design and build prototype



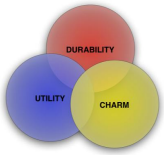
In Summary: DM Concerns

- Increased system resources
- Some actions may be cumbersome
- Macro techniques are often weak
- History and other tracing may be more difficult (replays)
- Visually impaired users may have more difficulty
- You will see more of it – Wii was really groundbreaking



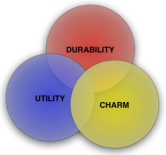
Menus, Form Completion, Dialog Boxes

- Our everyday world on the web
  - Information Architecture
- Many issues worthy of experimentation:
  - Depth versus breadth - studies support it
  - Frequency, recency, positional constancy (graying for focus)
    - Serial position curves
    - But beware of vertical scrolling – changes what is recent
  - Possibly adapt menu design to cohorts - task analysis
  - Position markers in long interactions to provide information on where you are and the ability to move backwards



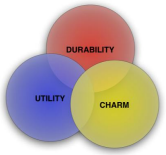
Form Completion Guidelines

- Meaningful title
- Comprehensible instructions
- Logical grouping and sequencing of fields
- Visually appealing layout of forms
- Familiar field labels
- Consistent, standardized terminology, abbreviations
- Convenient cursor movement
- Error correction for fields
- Error prevention
- Error messages for unacceptable values
- Marking of optional fields
- Explanatory messages for fields
- Completion signal and % done



Dialog Box Guidelines

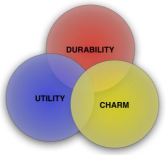
- Internal Layout
  - Meaningful title, consistent style
  - Top left to bottom right sequencing
  - Clustering and emphasis
  - Consistency in layout, terminology, appearance
  - Standard buttons (ok, cancel)
- External Relationships
  - Smooth appearance and disappearance
  - Distinguishable but not overpowering boundary
  - Easy to make disappear
  - No overlap of required items (pop-ups)
  - Clear how to complete cancel (e.g., focus)



HTML5: Web form input types

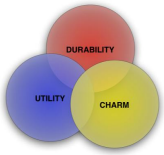
- Search boxes, spinboxes, sliders, color pickers, telephone numbers, url, email. Calendar date pickers, precise date-time stamps, placeholder text, form autofocus (e.g, google autofocus in search box)

Html 5 expands your capabilities



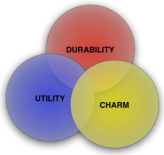
Information Appliance Issues

- Account for target domain (and users)
- Dedicated devices mean dedicated user interfaces
- Allocate functions appropriately, consider usage frequency and importance
- Simplify, focus on important functions, relegate others to platforms
- Design for responsiveness, plan for interruptions, provide continuous feedback
- Safety



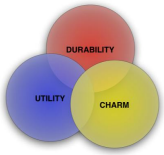
HTML5

- Canvas
- Embedded video
- Geolocation
- Persistent Local storage
- Offline web applications
- More fun with HTML Forms



But first

- Can your browser handle it
- Modernizr
- http://www.modernizr.com

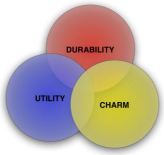


HTML5: Canvas

- "a resolution-dependent bitmap canvas which can be used for rendering graphs, game graphics or other visual images on the fly."

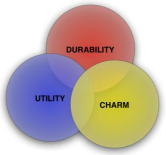
HTML5:Video

- A new element, <video> for embedding video w/o plug-ins:
  - video/mp4; codecs="avc1.42E01E, mp4a.40.2"
  - video/ogg; codecs="theora, vorbis"
  - Video/webm; codecs="vp8, vorbis"



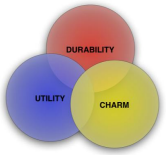
HTML5: Local Storage

- Cookies are limited in size, browser sends them each new page request
- Physical access to computer is all that is necessary to examine and change the storage db
- Within browser sites can read and modify their own data but not others



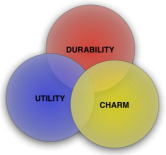
HTML5: Web Workers

- Standard way to run JavaScript in background



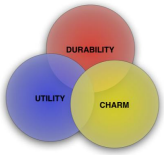
HTML5: Offline Web Applications

- Offline enabled web sites – tells browser what files necessary to work offline
- Then you can revisit web site even when not connected



HTML5: Geolocation

- Uses multiple methods to discover where:
  - IP address
  - Wireless network connection – cell tower locations
  - Dedicated GPS



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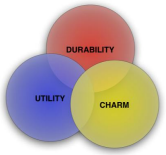
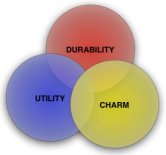


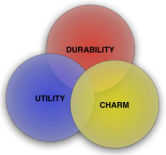
Command and Natural Languages

- Language Design Goals
  - Precision
  - Compactness
  - Ease in reading and writing
  - Completeness
  - Speed in learning
  - Simplicity to reduce errors
  - Ease of retention over time



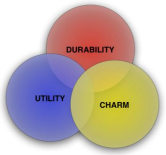
CNL -2

- High level goals:
  - Close correspondence between reality and notation
  - Convenience in carrying out manipulations relevant to users' tasks
  - Compatibility with existing notations (regular expressions)
  - Flexibility to accommodate novice and expert users
  - Expressiveness to encourage creativity
  - Visual appeal



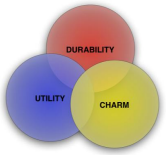
CNL-3

- Constraints on Language
  - Capacity for humans to record notation
  - Match between recording and display media
  - Convenience in expressing (including speech)



Unix Gems

- ls -f *.doc
- grep vesonder *.txt > namefiles
- cat datafile | uniq -c | sort > counts
- rm *
- enscript -2rgh $*
- man rm

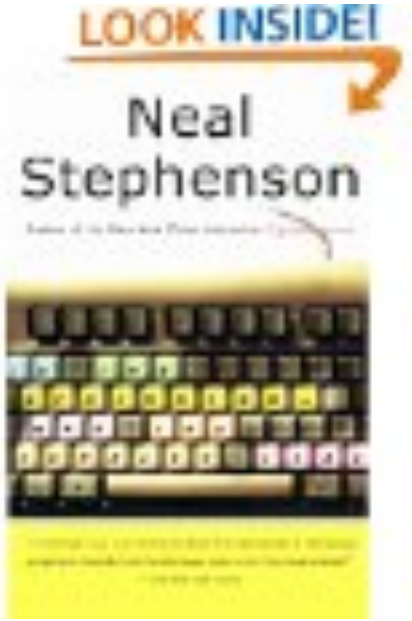


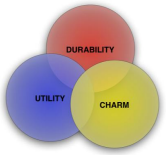
Command Language Guidelines

- Create explicit model of objects and actions
- Choose meaningful, specific, distinctive names
- Try to achieve hierarchical structure
- Provide consistent structure (hierarchy, argument order, action-object pairs)
- Support consistent abbreviation rules (prefer truncation to one letter)
- Offer frequent users the ability to create macros
- Consider menus on high speed displays
- Limit the number of commands and ways to accomplish the task (anti-PERL)
- Provide history and command line editing

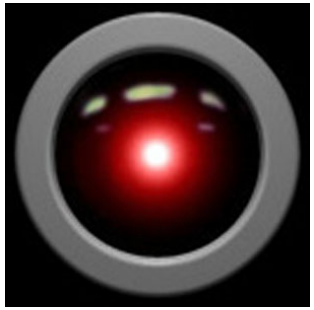
In the Beginning was the Command Line

- http://www.cryptonomicon.com/beginning.html

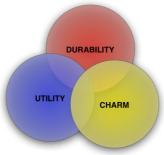




Anthropomorphic



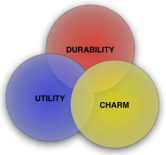
- A resource sink but
  - IVR, database query, intermittent users
- Human/human interaction is not necessarily an appropriate model for HCI
- Habitability issue - how users can know what objects and interactions are appropriate
- Use in IVR, e.g., HMIHY
- Expanding to gesture recognition, facial expressions, eye movements - even a mailing list on artificial emotion



Errors

- Simply, design for errors, they will happen
  - UNDO!
- Things not covered, as Parnas would call them, are Undesired Events
- Norman Types of errors
  - Slips resulting from automatic behavior
  - Mistakes resulting from conscious deliberation

Errors!

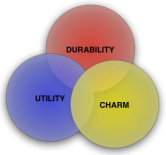


UE - Undesired Events

- Basis for exception handling
- Always aspects of a program's execution environment that do not behave as we wish - if you will, defensive programming
  - Arises from the "normal" behavior of the real world
- Goal is to anticipate what can go wrong and make (the possibility for) accommodations in advance that do not mess with the structure
- Basis for variants of throw and catch

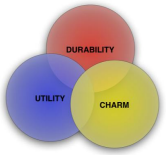
Not only for computers…

Errors!



Slips

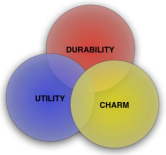
- Intend to do one action and discover you are doing another
- Psychology of everyday errors
  - Some slips may have darker meanings (Freud)
  - Most slips can be accounted for by simple things
- Slips result from lack of attention - folks can only concentrate on one thing at a time
- Examples of slips ... SMS



Capture Errors

- A frequent activity takes charge instead of the one intended
- Two different action sequences have their initial stages in common, with one being unfamiliar (or more recent) and the other being well practiced
- Driving to work on Sunday - similar purposed apps – different commands
- Your examples?

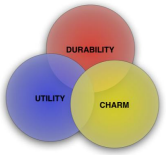
Errors!



Description Errors

- The intended action has much in common with others that are possible
- Internal description of intention was not sufficiently precise
- Correct action on wrong object
- User experienced and well practiced but not paying attention
- Orange juice into a coffee cup, saving into wrong directory
- Yours?

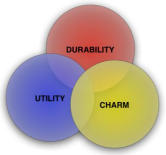
Errors!



Data-Driven Errors

- Automatic actions are data-driven triggered by arrival of sensory data
- Dialing 9 first on my home phone for a conference call (also could be frequency)
- Yours? This taken advantage of in computer twitch games

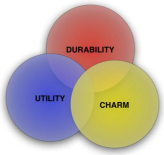
Errors!



Loss-of-Activation Errors

- Forgetting to do something or forgetting part of the act
- Activation of the goals has decayed
- Too numerous to state just one -- common walking from my office to the lab (50 yds)
  - Increases with age
- Saving but not closing app
- Yours?

Errors!



Mode Errors

- Devices have more than one mode and actions appropriate for one are not for the other
- Especially when controls must do double duty and device does not make mode visible
- Digital watch (gulp! Automatic pilots), vi vs emacs
- Yours?

Errors!

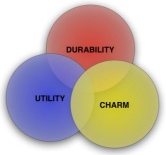
Yet Another View of Errors Thimbleby

We want to reduce an error's persistence once it is made!

- User may slip and randomly fall off path
- User does things in wrong order
- User misses steps but does sort of right things (on the wrong path)
- Miss some initial steps – preparation, but then proceed on right path
- They may quit before end of path, acting as if finished – completion errors (writing to file

- They may follow a correct path for a different task – everything looks smooth, could be transfer error
- If two paths start same way they may go down the preferred, more frequent path – they start out doing what they meant, but … capture error
- Users may not stop when they have otherwise completed task – overrun errors

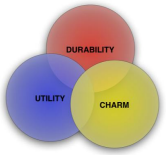
Errors!



Detecting/Preventing Slips

- Discrepancy between goal and result - requires feedback
- Issue actions can be specified at many levels and you have to provide feedback at appropriate level
  - Makes error correction difficult - wrong car syndrome
- Error correction mechanism usually starts at lowest level possible and works its way up the chain

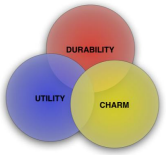
Errors!



Slip Prevention

- Mode errors are minimized by minimizing modes - Doh!
  - Or at least making them visible
- Confirmation before a command is executed is cool but ill-timed, user still usually content with choice, confirming action not, for example, the file name or pattern to be deleted
- Gaining attention or reducing attention demands!

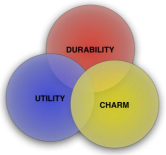
Errors!



Mistake Heuristics

- Seldom does a major accident occur without numerous errors
- Social pressure is a factor in many accidents
- Try forcing functions - Atari game example
  - A form of physical constraint
  - In safety engineering known as interlocks, lockins, lockouts
- Warning signals are usually not the answer --they can go off in error and are often subverted

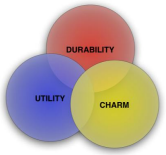
Errors!



Designing for Error

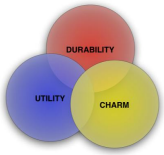
- Understand the causes of error and design to minimize those causes
- Make it possible to reverse actions or make it harder to do what cannot be reversed
- Make it easier to discover the errors that do occur, and make it easier to correct them
- Change the attitude toward errors, folks are getting there by imperfect approximations
- When someone makes an error there is usually a good reason - record it

Errors!



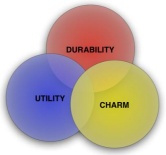
Design

- Time is the devil -- the force that works against evolutionary design
- The curse of individuality -- marking behavior
- Phone & typewriter
- Do not permit focus on cost, durability aesthetics get in the way of usability and understanding (right!)



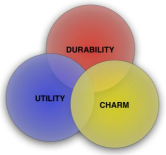
Why Designers Go Astray

- Aesthetics first – room numbers at Babbio Center
- Designers are not typical users
- Designers clients (aka stakeholders) may not be users
- There is no such thing as the average person
  - Make everything adjustable
  - Designing with our future selves in mind -BBs
- The problem of focus, selective attention, squeaky wheel- problem case



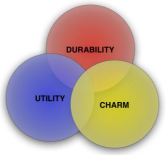
Designer's Daily Temptations

- Creeping featurism
- Worshipping false images
  - Both designer and user are tempted to worship complexity, Maeda on white space (and sometimes inappropriate metaphors)
  - Component interaction (see Parnas again)



How to Design HCI Wrong

- Make things invisible (different from the invisibility of the tool)
  - Widen gulf of execution - no hints to the operations expected
  - Establish the gulf of evaluation: no feedback, the tyranny of the blank screen
- Be inconsistent, change the rules
- Make operations unintelligible use idiosyncratic language or abbreviations, uninformative error messages
- Be impolite - treat errors rudely
- Make operations dangerous rm *.* at / and unrecoverable



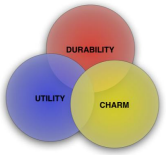
Current State

- Select topic, Target E's
- HCI development report
- Industry + questionnaire + ? data -> persona
- Begin first pass design – "eat your own dog food"
- Do PAR review of design – part of iteration
- Begin analysis plan (E related) for first user study
- Begin to design and build prototype

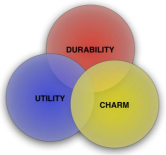
Project

Projects

TEAM	TOPIC	MEMBERS
KiddieCity	Educational location based app on cities	Liangyu Xiao, Thoka Alowaid, Weijing Zhao, Chia-Wei Chiang, Wan-Ting Chang, Jingying Wang
Wordcraft	Learn words, social media, multiple languages	Meng Wang, Ruixiang Chu, Jingzhe Tian, Praneeth Ammineni, Srihari Natarajan, Alexander Gurski
Stevens Yard Sale	Make friends, sell goods within Stevens Community	Cheng Liu(wc), Jingjing Lan, Nan Xie, Ruo Jia, Rui Ma, Xintong Wang
icrib	Find a place to live	Madhura Kamat, Muath Khawaji, Swati Mittal, Himabindu Chaturvedula, Richard Sass, Aakash Yatish,
iHouse	Intelligent house with energy conservation	Xiaoran Liu, Ke Lei, Miao Li, Shanmiao Liang, Zhoushuo Wang , Mengyi Gong,
h2oken	Find essential items	Krzysztof Jordan, Zachary Smith, Michael Peleshenko, Dane Pilcher, Ryan Phillips, Guanyi Li, Jing Yang
My Travel	Share travel planning with friends	Guangji Wang, Zhengfei Duan, Xiao Han, Hao Wu, Dingxue Li



Any questions on the Mid Term or Mid Term content?



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