



Class 3 CS545

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Welcome to class 3



Roadmap

- Log Book
- Tidwell Patterns
- Story Boards
- Low Fidelity Prototyping
- A bit on Requirements
- The Project
- Readings this class:, Tidwell chapter 2, Stone chapters 2-5
- Readings next class: Laws of Simplicity, <http://lawsofsimplicity.com/>, Tidwell Chapter 3

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Today we will focus some time on Tidwell's patterns, continue to discuss personas and give you some hints on questionnaire design. We will finish up with discussing the project.

Texts

- Stone, D., Jarrett, C., Woodroffe, M. and Minocha, S., User Interface Design and Evaluation, Elsevier, 2005, ISBN: 0-12-088436-4 (S)
- Safer, D. Microinteractions, O'Reilly Media, 2013, ISBN: 978-1491945926 (M)
- Tidwell, J. Designing interfaces, Second Edition, O'Reilly Media, 2011, ISBN: 1449379702 (T).
- Norman, D.A. The Design of Everyday Things, Basic Books, 2002, ISBN: 0-465-06710-7 (N) **OPTIONAL**

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Please note that Norman is optional but wonderful. The examples may be a bit dated but he has a real knack of expressing the essence of usability and illustrating it through example. Stone, et. Al., is just a great text on how to do practical usability. Safer which we will examine in the second half of the course is all about the details. In many ways the quality of the user experience is how well you fret the details. Finally Tidwell's patterns books provides us with a compendium of ways to express the user interface.

EcoPsychology

- Reduce, Reuse, Recycle, Rethink:
Thimbleby(2007)
- Design for dismantling, recycling, upgrading,
reconditioning, durability
- Design Flexible interfaces
- Consider Whole life-cycle energy costs



Part of usability in your future is green concerns.. Although you have not heard a lot about Ecopsychology, it or some variant of it is will be extremely relevant to usability. The key is to consider reusability and environmental factors in your design. Most of this makes sense but it is often not considered very seriously in design similar to issues of accessibility. Given global warming, increasing population pressures and scarcity of resources, now is the time! Last week I was in the Netherlands discussing both sustainability and resilience – the ability to survive major weather or other catastrophic events.



On Tidwell!

- Begin Tidwell – characterize your project based on these attributes.
 - It is important to create a vocabulary
 - Taxonomy is the first stage of any science
 - Classify what you have
- These first patterns describe human behaviors – not design elements

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Last week I introduced some of Tidwell's patterns, this week we will dive into these first, more general, patterns.

Chapter 1 Patterns(Tidwell)

- Safe exploration
- Instant gratification
- Satisficing
- Changes in Midstream
- Deferred Choices
- Incremental construction
- Other People's advice
- Habituation
- Microbreaks
- Spatial Memory
- Prospective memory
- Streamlined repetition
- Keyboard Only
- Personal Recommendations

So now on to the book we are using. Tidwell starts with patterns in the large in the first chapter. In a sense, Safe Exploration is a form of humane computing – being able to undo or get back to your previous state. Instant gratification is possible when you can immediately meet some of the users goals in visiting the site.

Satisficing is a term that means you provided the user with information or an experience that was just good enough. Often we spend considerable effort with reduced returns, so try to offer an acceptable experience and then go for incredible. It is not always desirable to strive for perfection.

Review the others in Tidwell and think hard on whether you can use any of these large patterns in your term project. I appreciate Tidwell's opportunity to provide a wide array of patterns, that can help you now!

Please read and study them carefully.

Flow: Optimal Experience

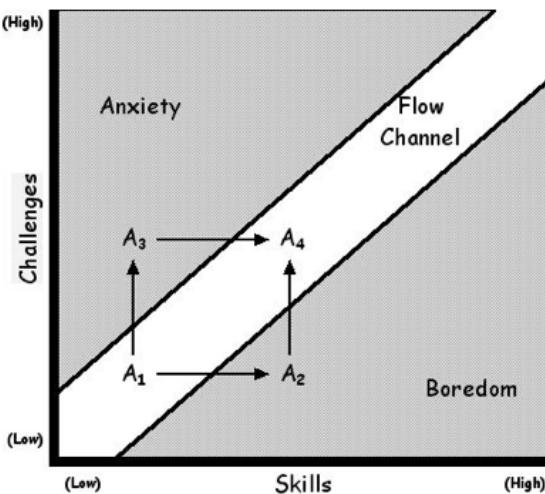
- You forget where you are, time flies
 - Self consciousness disappears, sense of time distorted
 - Goal directed, rule bound, action system that provide cues as to how well you are doing
- **YOU? What were you doing?**
- Again: rules, requiring learning of skills, establishing goals, provide feedback, make control possible

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SO all of these meta patterns really deal with the concept of flow – of essentially being so involved with the interface that the world around you disappears. Games often provide this sort of escapism. Consider the last time an game or a novel has made you forget the external world. I bet you experience that often when working with my lectures! Haha not! But I would like to strive to accomplish that.

FLOW!



http://www.gamecareerguide.com/features/1120/tuning_difficulty_when_making_.php?page=3

Figure12.1. A diagram illustrating Mihaly Csikszentmihalyi's theory of flow. Source: Csikszentmihalyi, Mihaly. *Flow: The Psychology of Optimal Experience*. New York, NY: Harper and Row, 1991.

This diagram explain the components of flow the key is to balance the challenge with the required skill and as the user progresses you want to increase the difficulty without surpassing the user's skill at the moment. Again Angry Birds strives for this. So do trainer's in sports. If something is to easy for your skills you get bored and if something is to hard you get frustrated and anxious the key is to place your user in the white zone, the sweet spot.

I will not get into the details of this slide or the theory but I wanted to give you a notional appreciation of it.

Habituation

- Be careful of keying traps
- Make dangerous key chording unique
- Using popular key combinations in different ways is annoying
- Standards
- Example – vi and emacs

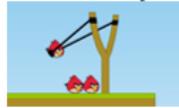
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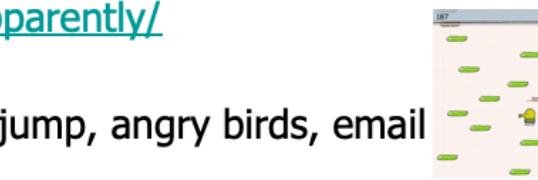
Strive to capitalize on standards in your interface. If control-C means copy in your operating system of choice then it should be copy in your interface. Most Operating System Interfaces have interface guidelines. Follow them!

Microbreaks

- Apps as Time fillers
- Sometimes productive or relaxing
- <http://betanews.com/2014/10/10/how-many-times-a-day-does-the-average-person-check-their-phone-221-apparently/>
 - British Study
- Examples: doodle jump, angry birds, email



http://cdn9.gamepilot.com/data/l/6/6/16699_250x150.jpg



<http://screenshots.en.sftcdn.net/en/scrn/317000/317219/doodle-jump-2.jpg>

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Ahh microbreaks . You are waiting for the Stevens shuttle or riding on the Stevens shuttle. You need a break from the day. Games that permit you to play them for a few minutes are perfect and often refresh your mind – they provide a short break, a microbreak!

Spatial Memory

- Consistent menu placement
- Custom button and menu placement
- Do not make arbitrary changes
- Example: home button on firefox

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Again strive for standards! Both standards provided by the supporting OS (linux, OSX, Windows 10, iOS, android, ...) and of course your internal consistency. One of the negative examples of this is Firefox's home button. First they move it from the left of the interface to the right and now they have added a "show your bookmarks" icon that resembles the home icon. Those are arbitrary changes to me!

Prospective Memory

- Planning and reminders
- External cognition
- “knowledge in the head, knowledge in the world”
- Flexibility essential
- Example virtual sticky notes

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We will talk about external cognition later but a quick overview is that your workspace can be an external memory. You have post-it notes and the like to remind you and I have piles differentiated among graduate, undergraduate and research tasks. We will discuss distributed cognition later in the course.

Streamlined repetition

- Continuous repetition on often visited sites
- Save time
- Nice if you could inform user
- Examples: macros, shell scripts, automator app

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If a site or tool is intended to be used often there should be some facility to construct a script that encapsulates a standard sequence of commands.

Keyboard only

- Smart phones
- Chording
- Tab traversal and lists

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Early in the computer revolution there was a debate over whether a mouse was necessary. Why were there such strong feelings? Users thought that the mouse was bad because it took one hand off the keyboard! Until that time all work was done on the keyboard. Your project, especially if it is for tablets or phones should rely on the keyboard heavily with chording – typing multiple keys – as a way to do a command. Tabbing should be a way to traverse the site and lists can be used with the arrow keys,



Other people's advice

- More and more of our interaction is becoming social
- At the very least encourage users to make suggestions and offer help
- Example: stack overflow

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Essentially crowd sourcing advice. One of my favorites is stack overflow for programming, but the parent site Stack Exchange is much more
<http://stackexchange.com/sites#>



Personal recommendations

- Support person to person sharing of content
- Peer to peer as much as possible

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This is pretty self-evident. I find it interesting how circles and facebook have evolved. Circles is clearly more technical and facebook more personal.



Chapter 2 Patterns

- Feature search and browse
- News stream
- Picture manager
- Dashboard
- Canvas plus palette
- Wizard
- Settings editor
- Alternative views
- Many workspaces
- Multi-level help

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So chapter two goes from more Behavioral patterns to designs you can use now.

Left hand column (browse) big picture (feature) search (upper right hand)

News stream – reverse chronological order

Pictuer manager– thumbnails, sort expand

Dashboard - fitbit!, nest!

Canvas + palette – photoshop

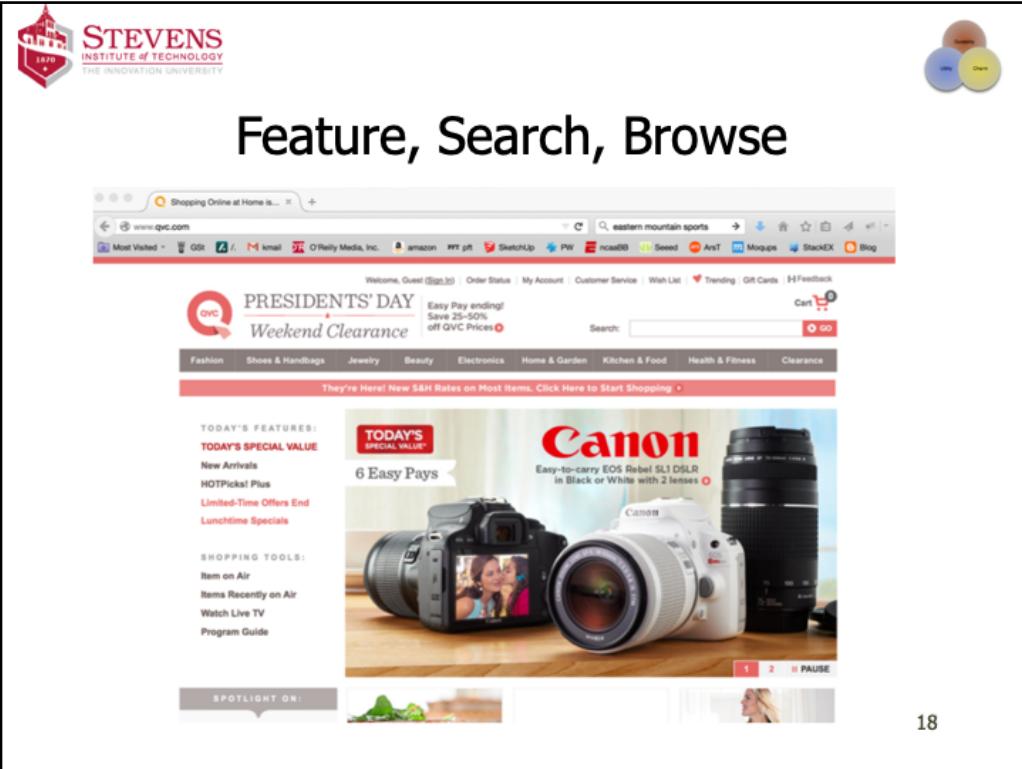
Wizard – word – take your hand

Settings editor– win control panel – clear settings

Alt views – power pt google maps

Many workspaces – X windows, firefox tabs

Multi lev help



This is a common web site design – especially for an ecommerce site. Canon camera is the feature, the search box is prominent and the left hand side and category listing across the page permit browsing.



News stream

The screenshot shows the Google News interface. On the left, there's a sidebar with news categories like Top Stories, Suggested for you, and a link to see real-time coverage. The main area displays several news items with images and titles. One story about Egypt is highlighted with a blue box. To the right, there's a weather forecast for Parsippany-Troy Hills, New Jersey, showing temperatures for the next few days. A pop-up window in the top right corner promotes the Google News app.

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Basically the newest items are first – they are above the page fold. What is a page fold? Consider real newspapers, they are folded and the articles above the fold are considered the most interesting. So think carefully what you would like to present above the page fold on your site.



Picture Manager

The screenshot shows a Google Photos interface. At the top, there's a navigation bar with 'Photos - Google+' and a search bar. Below it, a toolbar has 'Highlights' selected, along with 'All photos', 'More', and 'Upload photos'. A sidebar on the left shows a profile picture and the text 'Aging Hacker Chronicles 13 photos · Mar 5, 2013 - Jan 14, 2015 · Boonton Township, New Jersey'. The main area displays a grid of 12 images, including various electronic components, a person, and a 3D printer. Below this grid, another section titled 'Profile Photos' shows 9 photos from Jul 11, 2011 - Aug 8, 2014.

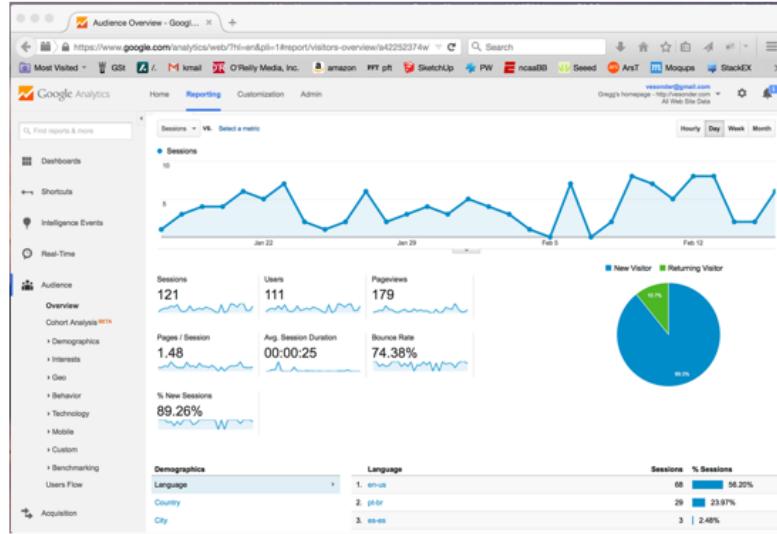
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Simply provides you with a way to manage pictures. This is the picture manager for my blog, Aging Hacker Chronicles, <http://aarphacker.blogspot.com/>



Dashboard

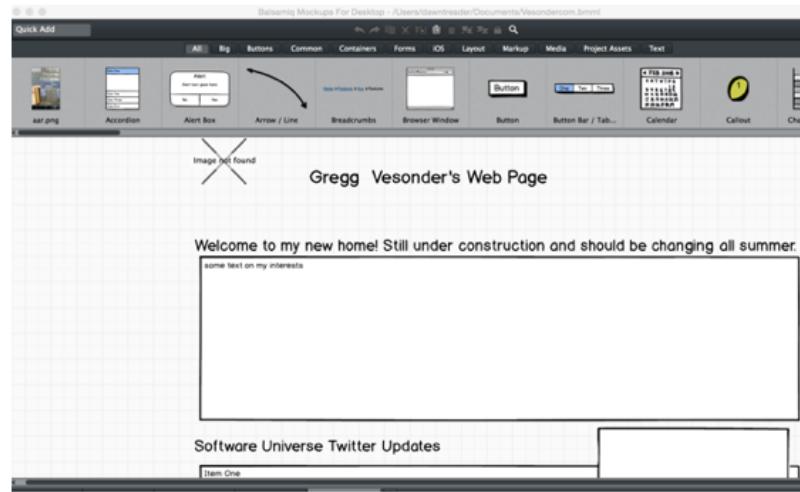


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A dashboard provides a quick overview of “analytics,” statistics relevant to your site or application or business or ... The key is to always show an overview of what is happening and then be able to drill down and select samples.



Canvas plus palette



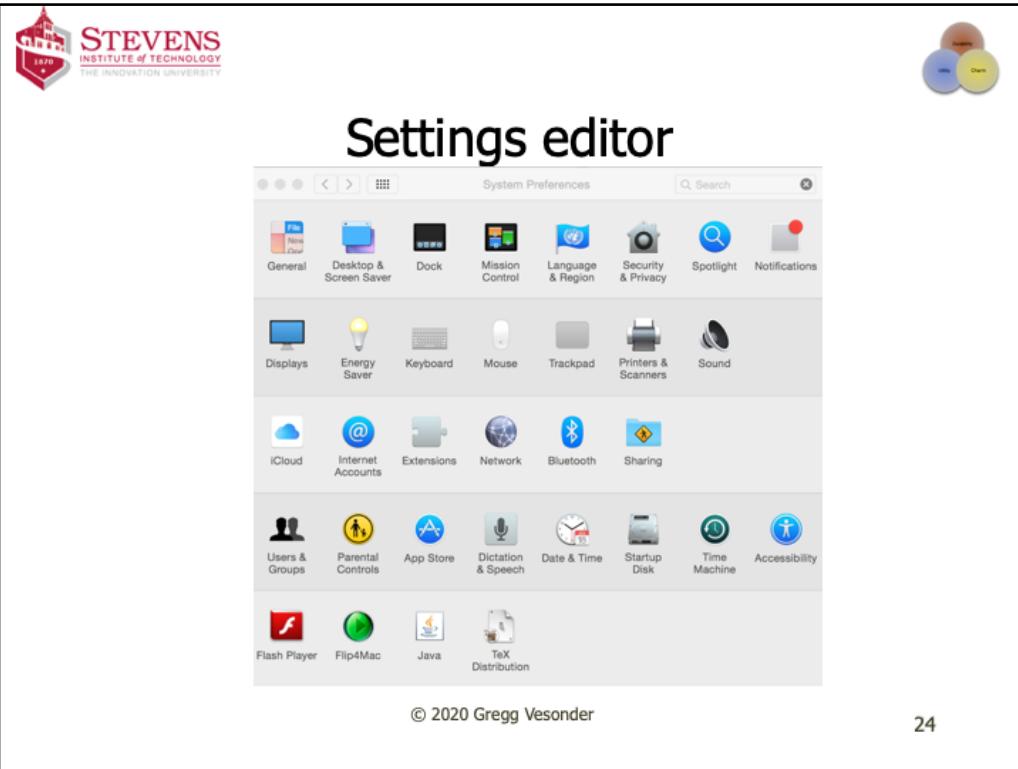
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This is useful when you are doing drag and drop design - You are provided with a listing of templates that you can drag into a workspace and modify. This is very popular scheme for the types of prototyping tools we will be using such as moqups.



A wizard takes your hand and walks you through what is necessary to create an invitation in Word for example. It provides a script with variations that makes it easier to do something. Generally such interfaces are for novices and as your expertise increases with the tool you should have the option to do it more quickly and perhaps with more variations.



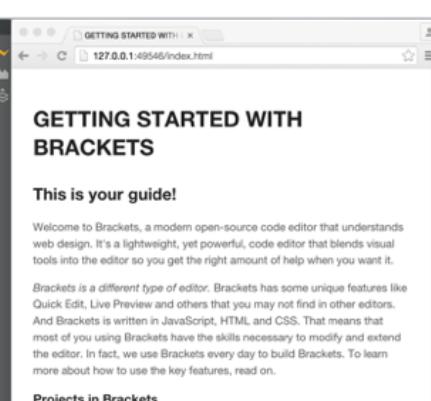
We are all exposed to these – it is a place to tune the environmental aspects of your app. Most games have them and one key setting is turning off the annoying background music.



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Alternative Views



Welcome to Brackets, a modern open-source code editor that understands web design. It's a lightweight, yet powerful, code editor that blends visual tools into the editor so you get the right amount of help when you want it.

Brackets is a different type of editor. Brackets has some unique features like Quick Edit, Live Preview and others that you may not find in other editors. And Brackets is written in JavaScript, HTML and CSS. That means that most of you using Brackets have the skills necessary to modify and extend the editor. In fact, we use Brackets every day to build Brackets. To learn more about how to use the key features, read on.

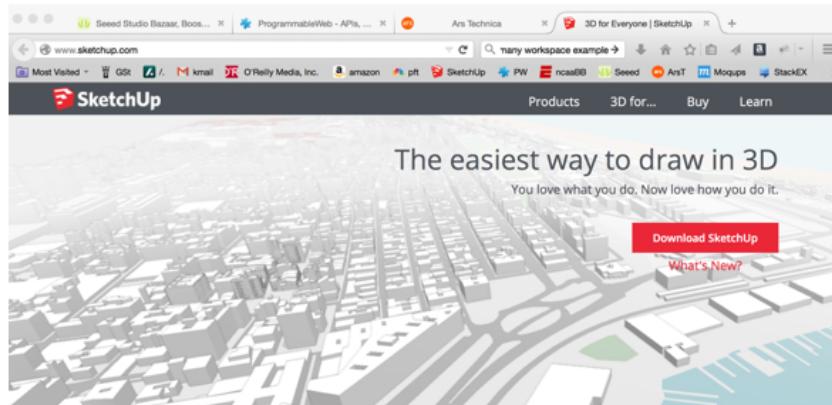
Projects in Brackets

In order to edit your own code using Brackets, you can just open the folder containing your file. Brackets treats the `src` folder as a "project".

Alternate views are powerful especially in IDEs. The example I show is brackets which is displaying the javascript and what the javascript becomes. Very powerful for creating and debugging but requires the user to have large or multiple screens.



Many Work Spaces

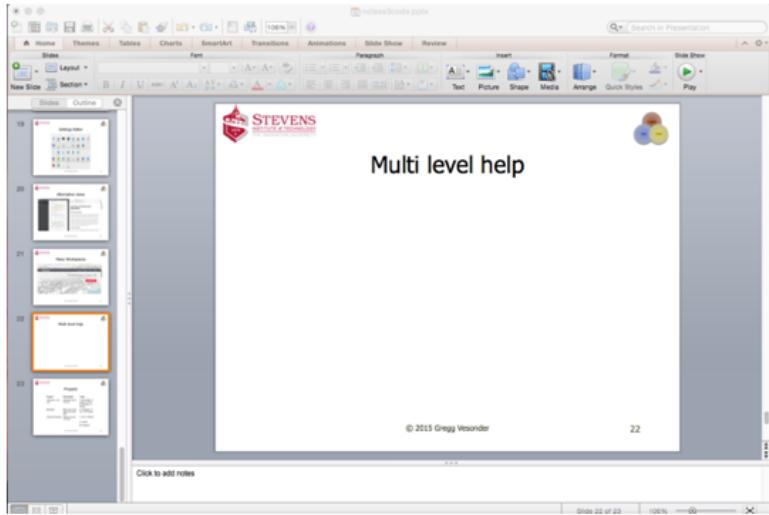


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Many workspaces is invaluable for large projects. It permits you to divide the project into subwork spaces, a house in one space a monster in another space and a spaceship in a third, while someone else works on the background that will contain these creations.

Multi-Level Help



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For very complex tasks multi level help is essential and you see that in applications such as word or excel. You can hover over an icon to discover what it does, search for information or even go to microsoft's site or Stack Exchange to get help.



So Far

- The team
- Brainstorming on ideas -> app idea
- Industry data
- Supplemented by Questionnaire
- Persona
- Use cases
- Story boards
- Low Fidelity prototypes

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You should be doing the tasks by mid week.



User Stories

- Beacon Info App
 - Download a smart phone app and use it in conjunction with Beacons
 - Smart phone app provides information on locations and people associated with these locations
 - Could get more specific

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This is a sample use case for the beacon a bluetooth low energy device that my lab is exploring. It provides precise location information indoors. So the next page provides a story of how it might be used, it gives life to the technology!



Joyce has heard about an experimental feature on campus that senses your location and provides information relevant to it. She heard about it in her usability class and her professor provided her with a url to download the app.



Joyce activates the app and when she presses the available locations button only Altorfer appears. She considers this fortunate since she is a software engineering major and Altorfer is where the faculty and lab are. The campus map points her in the direction of Altorfer and she heads in that direction.

Once she enters Altorfer she checks the app again. Wow has it changed. She is greeted with Altorfer news and an annotated map of the first floor! She notes that a nub of electronics is just inside the door and suspects that triggered it. It informs her that the new lab is still under construction and that Professor Gelman is in her office on the 4th floor.

Joyce takes the elevator to the fourth floor and is greeted with the annotated floor plan with indicators showing who is present. She also notes that another nub is there. She turns left and visits Professor Gelman after volunteering to help with the new student reception next week. She walks to Professor Vesonder's office. He is still not available but as she approaches his office his schedule appears. The schedule indicates he will be back at noon.

As she leaves Altorfer she deactivates the app and smiles. Even though still in its early stages, she thinks the app has possibilities. Perhaps I should ask whether I can work on this as my usability project? Professor Vesonder would like that since it is one of his pet projects. The ideas flow. I could add a leave a message feature at active locations and expand the active locations. I sure would like to learn what is in those electronic nubs at Altorfer. There is so much I could do. She smiles and heads off to the library.

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So this is my user story – you can see that it would be very easy to construct a storyboard from this that emphasize the flow.



And this can be drawn as a storyboard!

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Can you draw a storyboard for my story, capturing the flow. I will go through constructing one later this week



Next Class Assignment

A user story
A story board for your application
An assignment will be present tomorrow
With this and some other tasks

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So be prepared for an assignment that deals with the data you are collecting, a user story and a story board.



What follows is a more traditional view of requirements

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I thought a more traditional view of requirements also is helpful.

User Interface Requirements

- What area of expertise or domain?
- Who are the users?
- What do they want to do with the system?
- Where will it be used?
- **USER CENTERED!**

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So we have decided on the topic and have targeted a specific user base, therefore the next step is requirements. It should not surprise you that the emphasis is on the user. Actually if you have taken any of my other courses I always stress focusing on the user, since all system design has (or should have) a user centered design focus. How do we get there? The next few slides provide some of the techniques.



Observation

- Direct: side by sides, field studies, ...
- Indirect video, audio, interface recording
 - Lots of data
- Interviews
 - Structured - avoid leading questions, questionnaires and surveys - have an analysis plan - see backup slides
- Observe talk to and involve real users - sometimes not real easy
 - Primary user - the real user
 - Secondary user - all other stakeholders

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Of course observe the user in the daily activities you would like to address (if possible). There are many ways of accomplishing this and we list some of them. Stone, et.al., goes into further detail and is an excellent practical guide.

Necessary Information (Stone, p38)

| Focus | Information gathered |
|----------------------------|---|
| Domain | Wider specialist knowledge (context) and specific knowledge for computer system |
| Users | Who they are focus on - primary; consider - secondary |
| User characteristics | Age, sex, IT experience, educational background, motivation, attitude, enjoyment, satisfaction, ... |
| Task Characteristics | Easy, complex, novel, variable, repetitive, frequent/infrequent, single task or multitasking, time critical, solitary or collaborative. Safety? |
| Physical Environment | Noise, stress, comfort, dust, furniture layout, open-plan, hazards, ... |
| Social Environment | Work pressure, individual or collaborative, individual offices or open plan |
| Organizational Environment | Mission and aims, attitude to IT, policies, job design, role, management support |
| User support environment | Training, colleagues, keystone users, manuals, support desks, ... |
| Qualitative usability | For example, easy to learn, UI intuitiveness |
| Quantitative Usability | Usability metrics |
| Constraints | Cost, timescales, budget, hardware and software |
| Trade offs | Conflicting/contradictory requirements |

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As an example, this table taken from Stone discusses the types of information that you can collect .

Requirements Elicitation Techniques

- Asking: interview, questionnaire (appendix), structured interview, Delphi (group based)
- Task analysis: hierarchical decomposition
- Scenario based analysis: instances of tasks, use-case (not only for OO)
- Ethnography: studying folks in natural setting

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I have used this slide and the next two slides many times. You will draw on these techniques to acquire the necessary information.



Requirements Elicitation Techniques (cont'd)

- Form analysis: existing forms (may carry over in DTFs)
- Natural language descriptions: training, manuals, ...
- Derivation from existing system
- Domain analysis: study existing systems w/in domain, reuseable components

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Note that it is an excellent idea to examine the existing user design and, if possible, get any sort of logging information on how the system is used and the performance of the users. DTF means Down Time Forms, if the consumer system crashes information can be collected on paper and later entered into the system. The key to these forms is, since they are manually generated, they usually represent a distillation of what information is required.



Requirements Elicitation Techniques (cont'd)

- Business Process Redesign - radically redesign the processes, information processing systems should enable
 - At the very least rethink the existing process
 - Workflow
- Prototyping
- Usually it is a mixture of these

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Stone refers to a part of Business Process Redesign as the work flow. For those of you that took software architecture and design this is equivalent to the “alive view” in the 4+1 methodology, but focusing on people rather than software processes.



Questionnaire Design



- What age group are you in?
 - 50-60
 - 60-70
 - 70-80
- What is your gender?
 - M/F
- Where do you currently live?
 - Live by yourself at home
 - Assisted Living
 - Others
- Do you have a cell phone? If so, when did you buy your last phone?
- Would you recommend the phone you have now to your friends? Why / Why not?
- How frequent do you use your cell phone?
 - Never
 - Occasionally (Couple of times a week)
 - Always (More than 2 –3 times daily)
- What functions do you use most on your cell phone?
 - Dial Out Key Pad (Scale of 1-5)
 - Address Book
 - Email
 - SMS
 - Quick Dial Numbers
 - Headphone
 - Speaker Phone
 - Voicemail
 - Clock
 - Volume
- Are there any issues with visibility on the device? Is it clear enough?
 - 5 Very Clear,
 - 0 Not Clear
- Are there any issues with hearing the device? Is it loud enough?
 - 5 Very Clear
 - 0 Not Clear
- Do you tend to miss calls?
- What are the most common numbers accessed from your phone?
 - Home
 - Wife
 - Son/Daughter
 - Medical Emergency
 - Hospital/Doctor
 - Friends
 - Others (Describe)
- Are there any issues with accessing the functions on the phone? Are the buttons big and clearly labeled? Are you able to navigate?
 - 5 Easy to Navigate
 - 0 Not easy
- How long does it take you to find a number and call a person using your phone?
 - 1-2 Seconds
 - 10 Seconds
 - 30 Seconds and Higher
- Describe any other issues with using the phone.
- What functions would you recommend adding on your phone?

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This is an example of the questionnaire they used. It is not the best questionnaire but it is decent. Note the initial phase establishes the demographics of the individual and then focuses on issues pertinent to their term project. One key to questionnaire design is not to add questions that you will not use. In each case you should have a justification for the question. More on questionnaire design a bit later. However I want to stress that a questionnaire is not sufficient to gather industry data for personas. You also must seek out data about potential competitors and data on your demographics.



Questionnaire Design

- Much of the information derived from "A brief guide to questionnaire development" by Robert Frary
- Questionnaire preparation:
 - Focus on the information desired, write as few questions as possible, avoid "nice to know"
 - Have an analysis plan - arrange for a manageable number of ordinally scaled variables
 - Prototype it, including post questionnaire critique
 - Field trial of mailed questionnaire - response rate, question applicability (if trial shows same response for everyone, may be redundant)
 - Question performance

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Okay, from discussing personas to questionnaires. The neat thing about questionnaire, is that doing it right will make you a valuable asset not only for User experience but also in everyday lives with clubs and sports teams, ... anywhere you would like to poll opinions.

You can find the Frary article on the web, here's one of the urls:

<http://pareonline.net/getvn.asp?v=5&n=3>. It tends to move around so you may have to google his name.

Questionnaires are useful in getting information from users -- it is worth understanding the basics.

One key in questionnaire development is to focus on what you need to know and ask as few questions as possible. The shorter the form, the more likely it will get completed. Also understand what you will do with the information, the analysis plan. After you design the questionnaire, test it on a few friends or coworkers. Mailed questionnaires are useful but if you are doing consumer software (games), expect a very low return rate! Also if a question always results in the same answer it is not very effective -- it does not provide information. An effective question provides information and its performance has to be relative to other questions. For instance you may discover that democrats feel differently about an issue than republicans. These are really the essentials of building a questionnaire. The next few slides provides further heuristics.



Q2

- Avoid open ended questions - try blank completion
 - If all else fails, place open ended questions at the end, with a predetermined scoring strategy to max inter-rater reliability
- Objective questions
 - Avoid “other” - exception is if categories are clear-cut, few in number and some responders might feel uncomfortable
 - Avoid category proliferation - get the information you need. If you are interested in Windows 7 users only, ask “Windows 7 or other.”
 - Ordering of categories - go from lower level to higher level, e.g., never, seldom, occasionally and frequently

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Open ended questions take more time to score and they certainly cannot be automatically scored. If you must ask for an indeterminate number of responses to a question try to limit it to blank completion, of a word or so.

If you provide multiple choice questions, avoid other as a response -- it does not tell you much except that it was not any of the other choices. One exception is if the range of answers cannot be comprehensive -- for instance political party -- there are actually many political parties in the US, but we mostly hear about two. Other provides an answer for the smaller political parties. One good use of other is the Widows 7 question, it focuses on the categories of interest. There is no need to ask of Vista or XP, if you are solely focused on Windows 8.

Also provide “natural” ordering of categories, e.g, high to low or low to high depending on the category. Usually prototyping the questionnaire will catch these difficulties.



Q3

- Scale points
 - Avoid scale point proliferation ... 4 to 5 points is usually sufficient and never go for more than 6 or 7. - JNDs, just noticeable differences. This is true even if only the endpoints are labeled.
 - The use of a scale midpoint (odd number) be careful. May indicate: ignorance, lack of cooperation, reading difficulty, reluctance to answer, inapplicability. In most instances there will be a high number of neutral (midpoint) responders.
 - Without a midpoint (neutral) response, responders may avoid responding, try:
 - Encourage skipping if no response
 - Word responses so that a firm stand may be avoided, but a direction indicated, "tend to disagree"
 - Include options clarifying reluctance - not applicable, prefer not to answer
 - However, sometimes a midpoint is justified, "the amount of homework for this course was: too little, reasonable, too much"

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Too many scale points do not provide additional information -- There is a psychological concept of Just Noticeable Difference (JND) which defines the minimum perceivable gap between two points.

Also heed the advice on whether to use a midpoint (rate from 1-5, where 3 is midpoint or rate from 1-4 where there is no midpoint). I prefer no midpoint, but the homework question on the slide provides a rationale for using midpoints in some situations.



Q4

- Response category language:
 - "strongly agree" is redundant, use agree
 - Agree/disagree vs agree, tend to agree, ...
 - Read your questions carefully and test for hidden assumptions
- Avoid ranking if possible, and at most rank 6 or less things
- Apple pie phenomenon - rating everything at one end of the scale - have them rate both positive and negative statements

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Agree is agree, you either agree or you don't for questionnaire purposes (strongly agree provides no additional information it is used more as a rhetorical device) be critical of your own questionnaires. Ranking is really tough - avoid it or keep it to a few things, e.g., rank these car manufacturers from worst to best, rank your professors from worst to best (opps, no don't do that it may be too easy!).

Make sure that you construct questions so that they are forced to use the scale -- if not some folks get lazy and after a few questions just circle the same choice for the rest. Okay, back to user centered design.



Users

- Characteristics
 - Disabilities -- countries report that between 15 & 35% of the population have some sort of disability or impairment, for example almost 10% of men are color blind (less than 1% of women are colorblind)
- Questionnaire Completion
- Segment your user base into groups, make sure you have access to representative participants.
- Personas, imaginary examples of real users, a precise description of a user and what the user wishes to do with the system -- a set of personas – should represent data you have collected from public sources, your own interviews and questionnaires.

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Okay a bit of a review of where you want to be heading in the next week or so.



The Project

- At this point you should have assembled your team
- You should have your topic
- You should be refining your topic
- You should be checking competitors offerings
- Begin harvesting industry data – use your team, divide and conquer

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Project Refinement Heuristics

- Users should be readily accessible so that they can participate in the user centered design process
- Data should be accessible on the target group – essential to build your persona
- The scope of the project should be appropriate for a semester project – if unsure ask for advice
- You should have the appropriate skills to construct the prototypes
- It should address one of these topics: education, games or community

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These should be fairly obvious, note that if you are unsure, ASK! Hopefully you have followed these and if you want to make some changes you can. Of course please tell me about them!

Next week I hope to add a slide listing the teams.

References

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- Stone, Jarrett, Woodroffe and Minocha User interface design and evaluation, Morgan Kaufmann, 2005
- Pruitt,J. Aldin, T. The persona lifecycle, Morgan Kaufmann, 2006, ISBN: 0-12-566251-3
- Thimbleby, H. Press on, MIT Press, 2007

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Resources I drew from for the lecture. I highlighted in blue the books that go in depth about personas. In earlier classes I used Thimbleby's book as a text. It has more of an engineering bent – highly recommended. You will still see some nuggets from the book in the course.