Guide to Creating Work Models

Originally created by Prof. Jaime Ruiz

• For your project you’ll have
  • 1.5 - 2 hours of interview data per subject initially
  • Each subject interview will be captured by different team members
• After initial analysis, you may need to re-interview so you may have an additional hour of data for some subjects
• In total for your project you’ll have hour/hours of interview data per subject
• PLUS Audio, photos, and handwritten notes
• Data must be organized
Organize Your Data

• Transcribe interviews based scheduled interpretation session
  – If same day = handwritten notes (maybe annotated)
  – If next day = annotate handwritten from audio
  – If longer = transcribe

• Annotate print-outs of interviews, highlight passages, put physical flags on the pages

• Get video stills if you used video (QuickTime frame print)

• Print out snapshots, stills that epitomize certain phenomena
  – Annotate them, put Post-Its on them
  – Place time code on them

• Want to be able to quickly put hand on data, arrange it in physical space as you create models
Beginning Data Analysis

• Analyzing audio, written, and photographic data
  – Qualitative analysis
  – Called “coding” – “Coding” = assigning an interpretation
• Process involves
  – Transcription
  – Identification of interesting segments
  – Labeling clips
  – Aggregating labels into related segments
• Should be done as close in time as possible to interviews
  – Data becomes stale
• Even elaborating on notes
  – Captures more of data, fills in holes
The Art of Model Making

• Prime yourself with your data
  – Review transcripts
  – Play back a video

• Start sketching a model using the given data

• If you don’t know how to describe something, use whatever words or pictures make the most sense at the moment
  – Use pencil and paper (faster than graphics packages)
  – Draw sketches
  – The models will start to emerge
Work Modeling

• Five graphical models
  – Flow models
    • Depicts relationships between various individuals in work environment
    • Rare that one person does everything
  – Sequence models
    • Work is divided up into steps
    • Captures steps and the intention behind steps
  – Artifact models
    • People use and modify things
    • Understanding how and why reveals characteristics and break downs
  – Cultural models
    • Expectations, desires, policies influence work
  – Physical models
    • People adapt their environment so they can accomplish work

• Notes for affinity
  – Everything that doesn’t fit into one of the graphical models, plus key observations, insights, cultural model influences, questions, design ideas, and breakdowns you identify as you create the work models
Flow Model

• Flow model defines the roles people take on and how people communicate and coordinate with one another

• Lays out individuals and flow of information/artifacts between them
  – Provides a “bird’s eye view” of work practices within an organization

• Helps map breakdowns in the process

• Focus is on single individual and interactions individual has with others
  – One single person is “center of universe” in flow model
Work Flow Model, "Reviving DIDO", DLF Spring 2004, Michelle Dalmau, Indiana University
Flow Model Components

1. Individual
   – Represented by a bubble
   – List role name, subject identifier
   – List responsibilities

2. Other people/groups with whom the individual interacts
   – Each in their own bubble
   – List role name, responsibilities

3. Flow of communication between individual and others
   – Arrows between bubbles
   – Communication topics/actions labeled on flow arrows
   – Arrows should only go between individual and other bubbles

4. Artifacts
   – Information or physical items that move between individual and others
   – Shown as boxes on the flow arrows

5. Places that people go to accomplish specific tasks
   – Represented as boxes on the model

6. Breakdowns
   – Shown as a lightning bolt between individual and others
   – Indicates situations where individual could not successfully complete task
Sequence Model

• Models sequence of actions user performs to accomplish work
  – Similar to task analysis, flow charts
• Includes *triggers* that cause steps to start and *intent* of each step
• Once you know the intents, can redesign work
  – Mimicking current work flow just automates
  – Deeper intents help us redesign work to make it more efficient
<table>
<thead>
<tr>
<th><strong>Intent:</strong></th>
<th><strong>Trigger:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs to prepare 4 lectures for A214: Life and Art of Ancient Rome – Roman Religion</td>
<td>Class meets tomorrow afternoon, need to have first lecture ready</td>
</tr>
</tbody>
</table>

**Note:** In progress: PPT, Netscape 4.x, and file Finder windows open before we arrived. Loyal MAC (OS 9.x) user. Prompted by syllabus – topic for this week, Roman Religion

**Intent:** Recycle PPT – use a base PPT rather than start from scratch
Find existing PowerPoint (PPT) lecture on similar topic

**Note:** Keeps all the existing images/PPT slides
Copies (Saves As) PPT as A214 for Roman Religion Lecture

**Intent:** Colleague normally teaches this class (A214)
Goes to Classical Art Historian’s course web page (A210) – Bookmarked

**Intent:** Colleagues usually has good images (from DIDO)
Browses “Roman Gods” link (see Artifact A210 home page)

**Note:** Image quality assessment is automatic and very subjective
Identifies desired image /assesses quality

**Intent:** Expand lecture with reliable resource
*Downloads image (CTRL+Click) to “Download Image to Disk”

**Note:** Knows keyboard shortcuts

**Intent:** Dynamically builds own image collection
*Saves image to “Roman Art” folder

No sub-folders – many, unique images in one folder
*Renames image (long, descriptive names)

*Copy and Paste image into PPT slide

*Resizes/Positions image in PPT
Sequence Model Components

1. Steps
   – The blow-by-blow account of the work
   – What actually happens
   – Can be at high or low level, depending on needs
   – Linear ordering of steps

2. Order, loops, branches
   – Arrows indicating repetitive patterns of work
   – Decisions that must be made are branches

3. Intent
   – What the sequence is intended to achieve
   – Usually ascribed after the sequence is established

4. Breakdowns
   – Problems encountered when executing sequences
Creating Sequence Models

• Coded data can be fed directly into sequence models
• Look at everything in minute detail, transfer to sequence model
• *Pay special attention to hesitations*
  – Hesitations indicate situations in which user’s understanding of work is being “contradicted by the tools they are using”
Creating Sequence Models

• From interview, identify each main task
• Express task as an intent
  – Flow diagram can help with intents
  – Look at responsibilities from flow diagram
• Identify triggers which start task
  – Can be a regular occurrence (like arriving at the office)
  – Can be opportunistic (like a few minutes with no one around)
  – Can be on-demand (e.g. student knocks at my door)
• Add steps, showing links, loops, and branches
• Review steps, and fill in subsidiary intents that controls overall process
  – For example, in sales, maybe someone wants to up-sell once they’ve made the sale
• Add in breakdowns at any time as observed
Physical Work: Tools and Space

• People naturally augment and customize tools and space to support their work
  – How they think about and act on work revealed in physical artifacts

• Need to critically examine physical artifacts and space to understand how they help people get things done
  – Tools used (day planners, software packages, inboxes...)
  – Media used (paper files, forms, computer storage...)

• **Artifact and physical models** distill this information
Hints for Artifact and Physical Models

• Work from videos and snapshots of workplaces and artifacts

• Look for signs of wear and tear that signal how important certain items are
  – Buttons with worn out labels
  – Files that are dirty from repeated handling

• Look for flow of items within a workspace
  – Where does an artifact “travel” throughout its lifetime?
  – Who does it visit, for how long, and why?
  – Where does it start out and end?
Artifact Model

• What it is: Drawing or photocopy of an artifact

• Artifact model is annotated to indicate function of different parts of the artifact

• *How it is actually used may be different from the anticipated/designer use*
  – People will bend artifacts to their needs
  – These are *workarounds*
  – You need to identify these uses

• Look past original design and examine how it’s actually used in practice
  – Look at *user’s* intents, not just designer’s intents
Artifact Model Elements

1. Sketch, photocopy, or picture of artifact
   – Sketches to highlight particular aspects, copies/pics annotated by hand

2. Parts of artifact (e.g. parts of physical file folder)
   – What are individual parts of artifact?
   – Which are used, which are ignored?

3. Information contained in object
   – What information does it store?
   – How is it of use to workflow?

4. Presentation (e.g. fonts, white space, headings in a form)
   – How has artifact been designed to guide its usage?

5. Annotations
   – How has person extended (added to) the artifact?
   – How do they use it in ways beyond original design’s intentions?

6. Conceptually distinct elements (e.g. a person’s wallet organization)
   – How has person divided up artifact to support conceptually different tasks?

7. Usage (e.g. records used to play music, as rhythm section, as instrument)
   – How is the artifact actually used? List all uses

8. Breakdowns (e.g. quickly cuing to a desired location on a record)
   – What problems do people encounter when using the artifact?
Physical Model

• Physical space can be seen as a tool to support work

• Space can serve as an external memory store, as a guide to work, or as a hindrance to work

• *Caricature* of the elements of the space that are important to getting work done
  – Not a floor plan, not a detailed CAD drawing
  – Emphasizes critical parts

• Sketch or annotated image
Physical Model Elements

1. Places in which work occurs
   - Example: Office, break room, water cooler, hallway...
   - Keep in mind that work can occur in any number of places
   - Some of use of space is planned (booked meeting rooms), other is opportunistic (hallways)
   - Indicate properties such as size, primary vs. secondary workspace, whether it’s private or open, clean or cluttered, etc.

2. Physical structure that defines space
   - Items that partition, define use of space for work
   - Walls, tables, furniture, cabinets, bookshelves...

3. Tools, artifacts, and their locations
   - What is located where
   - Consider not only physical distance, but *spheres of work*
     - In front and in reach vs. swivel distance vs. walking distance

4. Usage of, and movement within, space
   - How people and artifacts flow throughout the space to accomplish work
   - Example: How records flow through space

5. Breakdowns
   - How space fails to support work
Cultural Considerations

• Any system needs to respect the culture in which it operates
• Culture defines:
  – Expectations
  – Desires
  – Policies
  – Values
• If system doesn’t mesh with the culture, it won’t be used
• Highlights the cultural influences felt by users of your system
  – These are parameters you **must** address in your design that go beyond:
    • Technological issues
    • Needs of a particular task
Be on the Lookout...

• What is the overall “tone” of the environment?
  – What is the attitude in the air?
• What policies, informal or formal, guide the work?
  – Will need to follow any policies in place
• Who has power over whom?
  – Don’t want to disrupt chains of power
• What values guide people’s work?
  – What is important, what is simply perfunctory?
Culture Found In...

• Verbal and non-verbal language used
  – Language unique to the users’ culture
    • “Decks” vs. “1s and 2s” vs. “Turntables” vs. “Record player”
  – How people speak, interact with one another
  – How people present themselves
    • Suit and tie for lecture vs. jeans and sweater

• Recurring patterns of behavior
  – What do people repeatedly do/say?

• Attitudes
  – “Not my problem...” vs. “Let me see if I can help...”

• Formal, informal policies
  – Written regulations
    • Company manual, posted signs
  – Government requirements
    • Gaining consent for users in a study at a university
  – Accepted conventions
    • Use of printed slides posted in elevators to announce talks
Cultural Model Elements

• Influencers
  – The people, organizations, groups that influence another person, organization, or group
  – Depicted as a bubble on the model
  – The size, degree of overlap of a bubble represents the “weight” or pressure the group exerts on another

• Influences
  – How one group influences another
  – Depicted as arrows between bubbles
  – Labeled to indicate how one group influences another
  – Label should use language representing how people feel or experience the influence
  – Not necessarily what you would hear spoken by people
  – But what they perceive the influence to be
  – Want to be clear about how the influence is felt by users

• Breakdowns
  – Lightning bolt to indicate when one group has a particularly harmful pressure on another group
Affinity Diagram (left) – things that don’t fit into one of the other work models, key observations, insights, cultural model influences, questions, design ideas, and breakdowns you identify as you create the work models