Atlanta 2006

Berkeley's User-Centered Design Process

…a work in progress

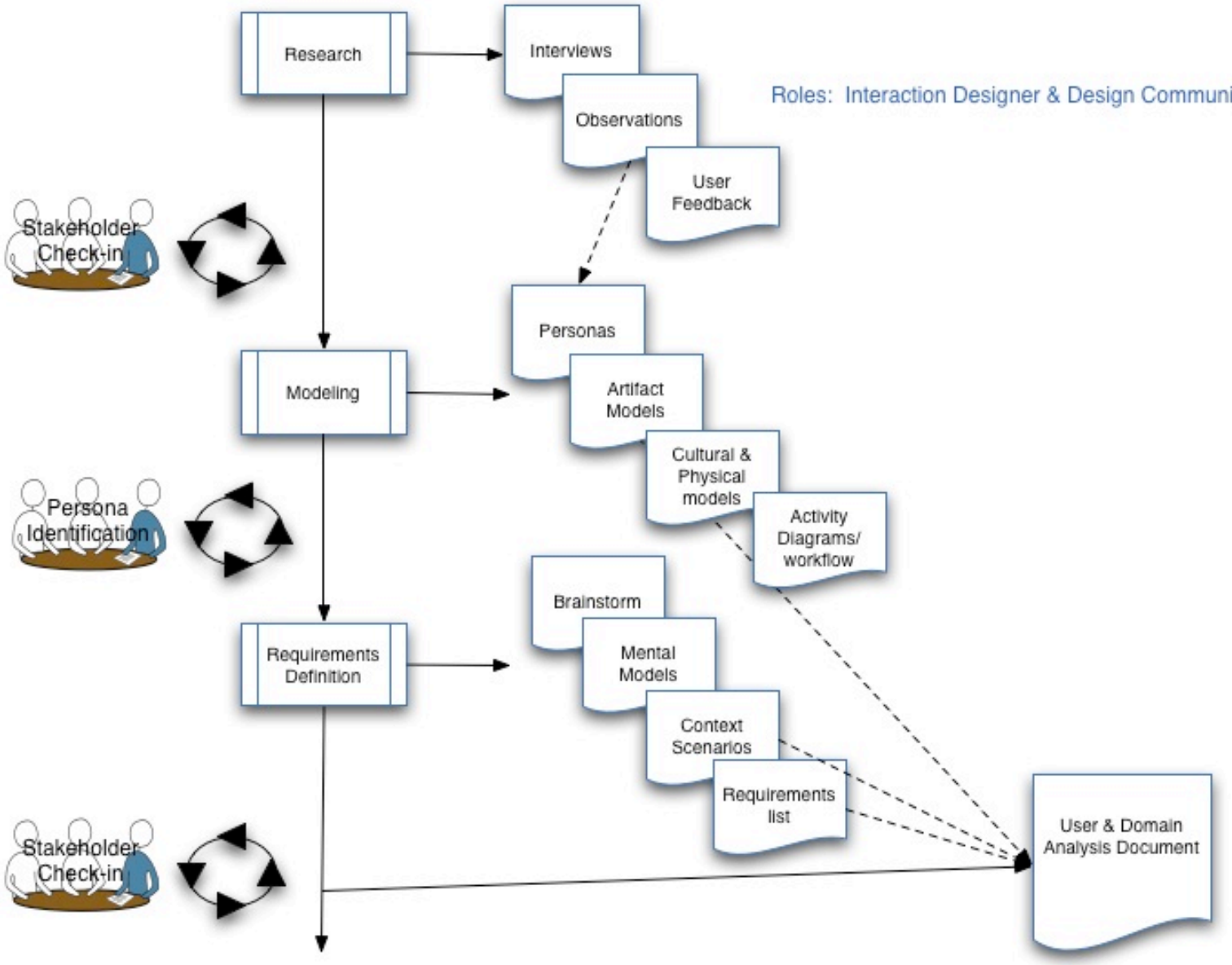
Agenda

- What does User-Centered Design (UCD) mean at Berkeley?
- How do you do UCD?
- UCD applied to Web Video Tool

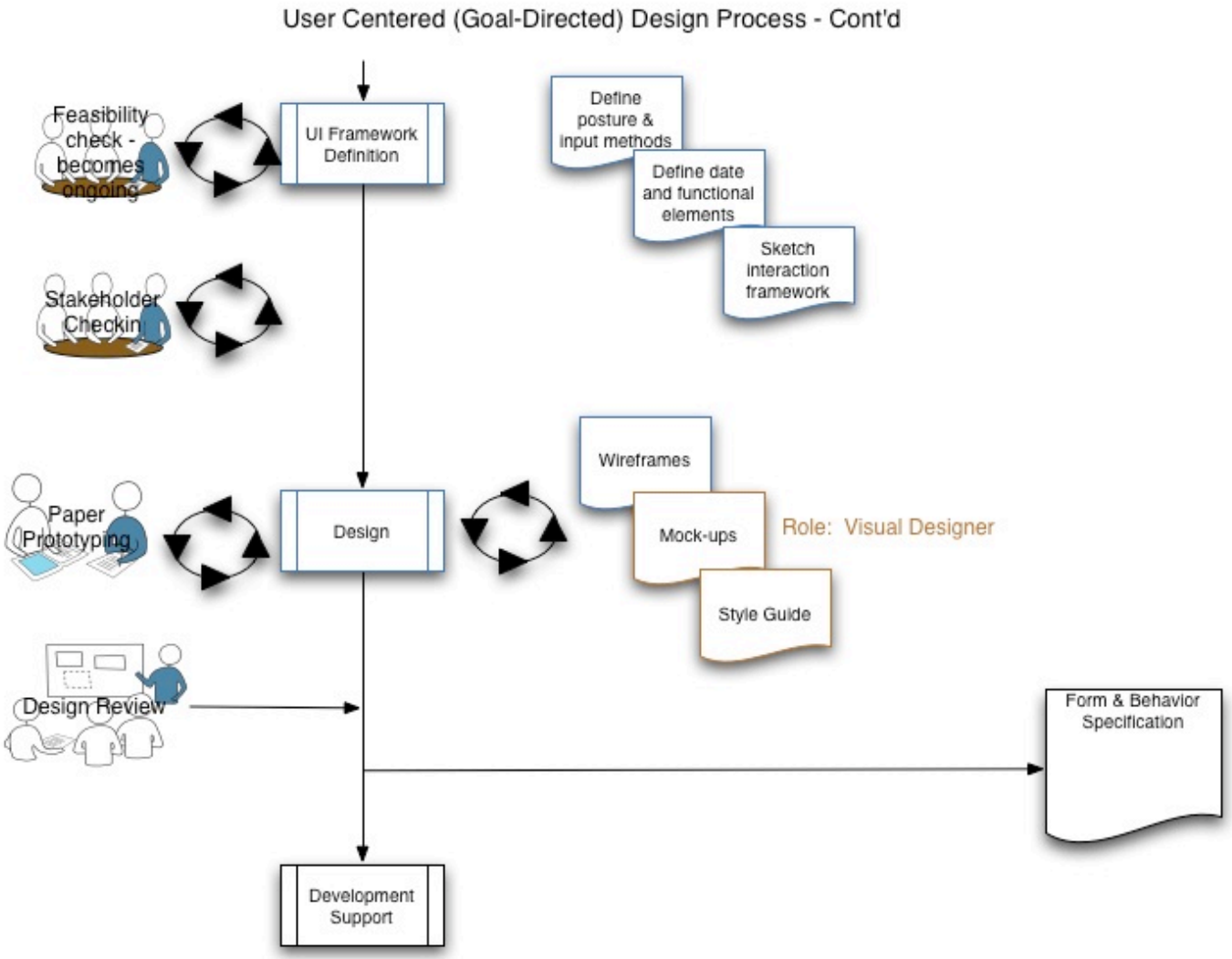
Berkeley's User-Centered Design

- Focuses on understanding:
  - Who are the users?
  - What are their goals?
    - Goals drive a person's actions
    - Tasks are things a person does in order to accomplish his goals
  - What are their pain points?
- To drive design

User Centered (Goal-Directed) Design Process



Roles: Interaction Designer & Design Communicator


User Centered (Goal-Directed) Design Process - Cont'd
Feasibility check - becomes ongoing
UI Framework Definition
Define posture & input methods
Define date and functional elements
Sketch interaction framework
Stakeholder Checkin
Paper Prototyping
Design
Wireframes
Mock-ups
Role: Visual Designer
Style Guide
Design Review
Form & Behavior Specification
Development Support

User Research

- Ethnography and empathic research
  - Observation & interviews
- Study users in their context
- Centered on users goals and activities
- Look for patterns

Modeling

- Make sense of research findings
  - Personas
  - Activity Diagrams
  - Communication Flows
- Gain consensus early on…before any design happens
- Shared language & vision

Requirements Definition

- Refined based on:
  - User needs
  - Business goals
  - Customer needs
- Scenarios

UI Framework Definition

- High level design
  - What pages do we have?
  - What panes need to exist within the pages and how do they work together.
  - What design elements are included in each page, pane, etc.
- Holistic Design
- Allows for iterating on the details

UI Design

"Design is the conscious and intuitive effort to impose meaningful order"

- Interaction design AND visual design
  - How does it behave?
  - What does it look like?
  - How does it make users feel?
- Wireframes and/or mock-ups

Development Support

- Constant communication
  - No throwing it over the wall
- Constant iterations as we learn more from development

User-centered design process

- ✓ Research
- ✓ Modeling
- ✓ Requirements Definition
- ✓ UI Framework Definition
- Design
- Development Support

Web Video Tools Problem Statement

- *The problem:*

  Content students use for studying and completing assignments is no longer solely in text form; video and audio are becoming increasingly common. The way students approach media content, however, is often quite passive: They simply view the video as they would a TV show, and listen to audio as they would a radio show. **Students that do wish to take a more active, intentional approach and to apply known effective study techniques (including highlighting and returning to significant points and ideas) have difficulties due to the opaque nature of the media**.

Sakai

WVT Problem Statement, continued

- *Affects*

  Students that use video or audio content to **study or complete assignments**

- *The impact of which is*

  Video and audio content isn't being used to its full potential for teaching and learning.

- *A successful solution would*

  Provide tools that **enable students to mark points in time** in video and **find points for purposes of review, reflection, study, and completing assignments**.

Research Activities

- Surveys
  - Faculty (10)
  - webcast.berkeley users in UCB classes (254)
  - Worldwide webcast.berkeley users (132)
- Observations
  - 3 students using webcast
  - Café, lecture
- Interviews
  - 3 students
  - 7 faculty members

Surveys told us:

- Bookmarking and video download are the features that are of greatest interest across the board
- Searchable captions, chaptering, and Powerpoint sync are the features most highly rated by webcast.berkeley students.
- Annotation is less popular than bookmarking.
- Interest in knowledge sharing tools is relatively low.
- The general webcast.berkeley audience is the only one highly interested in being notified about posting of video.

Interviews & observations told us:

- Greatest pain points are finding specific spots in webcast lectures
- Powerpoint slides are often-used reference point for finding
- There's administrative overhead in marking down time code for getting to or returning to specific points
- Students replay specific segments to aid in understanding, creating study sheets, etc.
- Students jot down notes while watching
- Students look at more than one webcast in a sitting

Modeling Activities

- Personas
  - Archetypes representing needs of a larger set of constituents
  - Based on research

- Activity Diagrams
  - Model existing user behavior and interaction with the system

Research | **Modeling** | Requirements Definition | UI Framework Definition | Design | Development Support

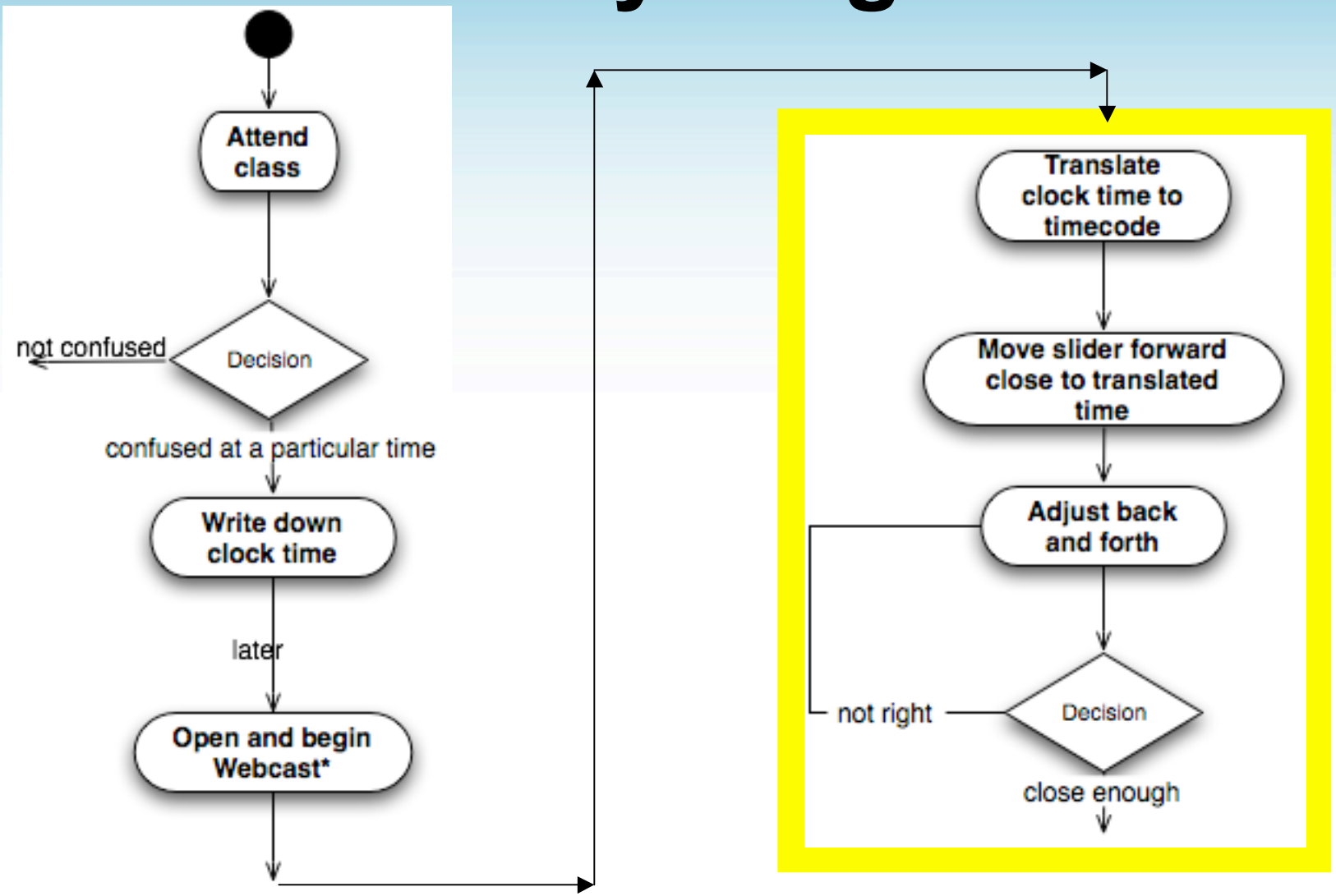
Primary Persona
Lisa Ng: Conscientious Student

- 2nd year undergraduate
- Planning to go to med school, so doesn't feel she can take risks with classes
- Rarely uses webcast as a replacement for class
- Relies on computers in lab on campus
- Use of webcast is primarily for studying for exams
- Good study skills: When studying with text, uses highlighters to mark parts she'll want to be able to find again & to identify key points or points of confusion.
- When doesn't understand what happened in class, uses webcast to review
- Refers to PowerPoint slides when studying

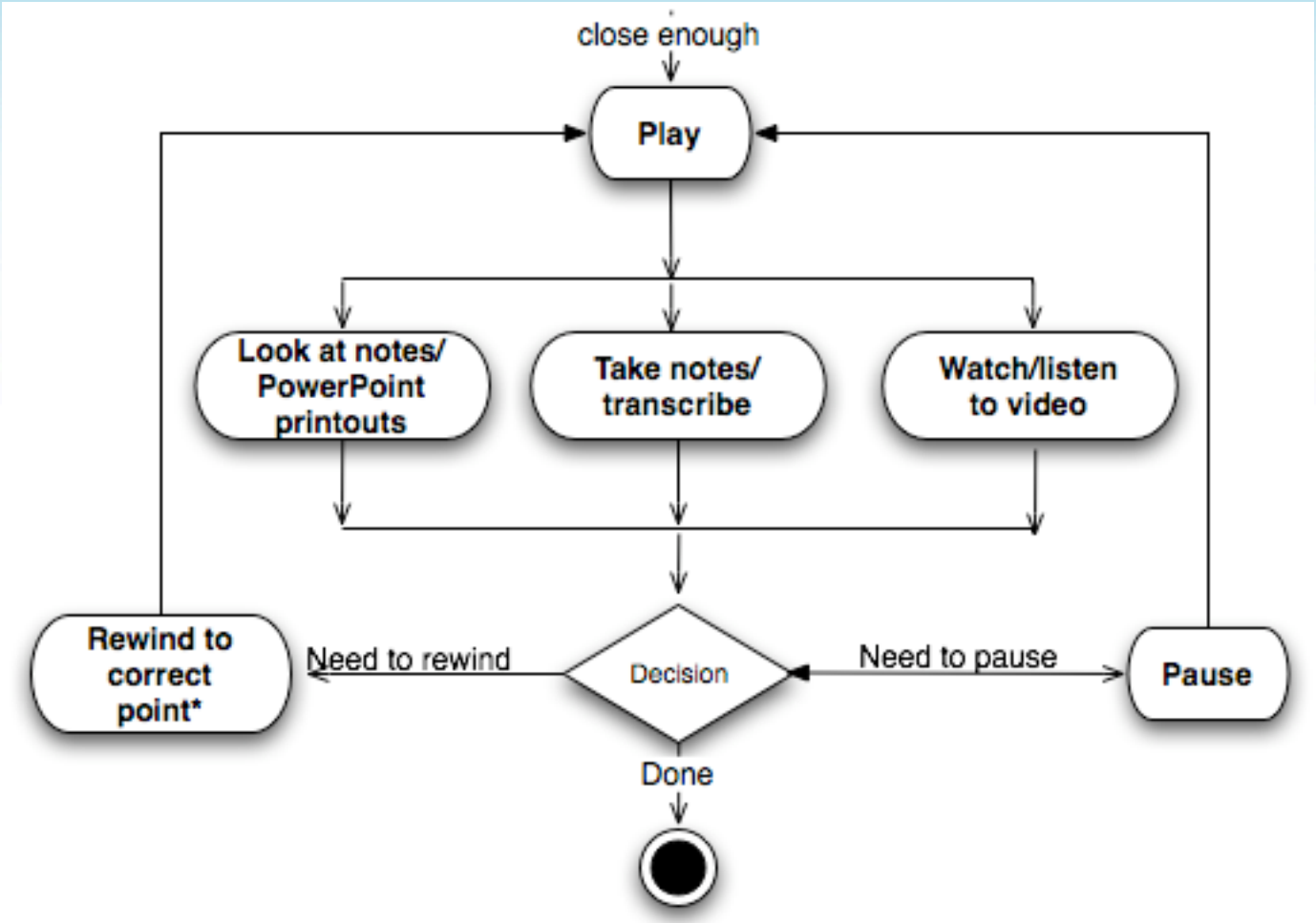
Personal goals:
- Stay healthy
- Have time to spend with friends

Academic goals:
- Get into Med school
- Feel confident walking into exams
- Be as efficient as possible

Activity Diagrams



Activity Diagrams



Requirements Definition Activities

- Context Scenarios
  - High-level, no interaction details
  - Focus is on how the user can achieve her goals
- Requirements Matrix
  - Identify necessary product characteristics and capabilities
  - Largely driven by context scenarios
  - Development team NOT the main audience
  - Covers data needs (what does each persona need to see), functional needs (what actions do they need to take), any other considerations

Research Modeling **Requirements Definition** UI Framework Definition Design Development Support

Context Scenario 1:
Getting Back to Confusing Part in Lecture

- Lisa is in lecture and realizes she's confused when the instructor starts talking about mitosis.
- She wants to be sure she's able to go back and review the areas she's not clearly understanding
- Later that day she opens up her bSpace course site and goes directly to the webcast for that day.
- She reviews the portions of lecture via the webcast she needed clarification on.

Context Scenario 2:
Studying for Exam

- Lisa has an exam coming up and wants to create a study sheet she can use for the next week while on the elliptical @ the gym.
- She gets out notepaper, her textbook, and her binder with PPT “notes” pages and gets comfy on the couch.
- She starts reviewing the powerpoints and notes from the lectures after the last exam. As she does this, she’s making notes (summarizing important topics) on her notepaper. (This will become her study sheet).
- As she’s making her way through the slides she decides it would be useful to hear the instructor’s explanation of DNA replication again.
- She goes to … a point in the webcast where that ppt slide is, and listens. One sentence he says seems to encapsulate the concept for her, so she tries to get it down word for word. Since her prof talks fast and does not always use lay terms, she relistens several times.
- After she feels like she understands, she adds some notes in the study sheet.
- She sees that there were a number of segments that she’d highlighted.

Requirements Matrix

Source	Data Needs	Functional Needs	Other Needs
Mental Model (based on prior experience studying with paper-based materials, and prior experience using webcast.berkeley and other video players)	• Highlighted segments • Place left off • Chapters • Lecture	• highlight a segment • keep track of place left off • annotate areas of interest • jump to labeled segment • watch in fast motion while ff'ing [scrubbing] • turn captions on/off • show full-screen	
Context Scenarios	• Powerpoint slide • visual of chalkboard diagram • points in lectures that cover topic x • ? Info about found points • slide title • picture of slide • segment title, keywords, annotation • caption text at that point • Lecture titles • point at which she wants to start play • words the instructor is saying • semester of webcast • current time in webcast • when logistical stuff is over	• find webcast via class then lecture • get to time in lecture where she noted confusion • play video • stop video • find point in webcasts via ppt slide • relisten/rewatch • print video screen • find parts of lecture that cover topic x • choose part(s) to watch • see previously highlighted segments • choose & watch selected segments • find webcast from any semester and go to time in webcast (including finding webcast) • skip logistical part of lecture (webcast) • jump forward in increments of time • jump forward in increments of	[none identified]

UI Framework Definition Activities

- Key path scenarios
  - Incorporate functional and data needs into the scenarios
- Table of Needs and Elements
  - Abstract out specific elements from the key path scenarios
- Sketch of interaction framework
  - Still no details
  - Rectangles! (Panes)

Research Modeling Requirements Definition **UI Framework Definition** Design Development Support

Key path scenario 1

Getting Back to Confusing Part in Lecture

- Lisa is in lecture and realizes she's confused when the instructor starts talking about mitosis.
- She wants to be sure she's able to go back and review the areas she's not clearly understanding. She looks at the clock and takes note of the when things start feeling fuzzy (10:23).
- When the professor introduces a new topic, she's fine for a while, but then gets an text message on her phone from a friend and decides it's important enough to read and respond to. When she realizes that she just missed several minutes of the lecture that might have been important, estimates the time she started chatting (10:40) and writes it down, too.
- Later that day she opens up her bSpace course site and clicks on the **Most Recent Webcast link**.
- bSpace switches to the **Use Webcast View** [page?]. The webcast for that day starts to play.
- Lisa looks at her notes to see the time she noted earlier, and enters it in the **lecture time field** . OR she uses the **slider**, looking at the **time display**, to get to the approximate time, and then uses the **jump forward and back incrementally widgets** to get to the precise time.
- The webcast begins to play from close to the same point in the lecture that Lisa became confused earlier that day.
- She realizes, however, that she needs to back up a bit to remind herself of the context. She uses the **jump back incrementally widget** to ba minute, and lets the webcast play from there until the end of that topic.
- She's still not completely confident in her level of understanding, so uses the **replay widget** to replay what she just watched.
- She then moves on to the next area she wants to watch by repeating her steps for entering the time and jumping to that part of the lecture. T time she doesn't need to rewatch; she simply needed to view what she missed the first time.

Key path scenario 2

Studying for exam

- Lisa has an exam coming up and wants to create a study sheet she can use for the next week while on the elliptical @ the gym. She gets out notepaper, her textbook, and her binder with PPT "notes" pages and gets comfy on the couch. She starts reviewing the powerpoints and notes from the lectures after the last exam. As she does this, she's making notes (summarizing important topics) on her notepaper. (This will become her study sheet). As she's making her way through the slides she decides it would be useful to hear the instructor's explanation of DNA replication again.
- She goes to her bSpace course site and clicks on the **Webcast tool** in the left Nav bar
- The **Find Webcast view** appears.
- In the **Search pane**, she types in a phrase indicating the webcast name and the slide title. The Search Results pane shows two results. By looking at the **thumbnails of the slides** (in results) that are included in the search results, she is able to pick the one she wants and clicks on it.

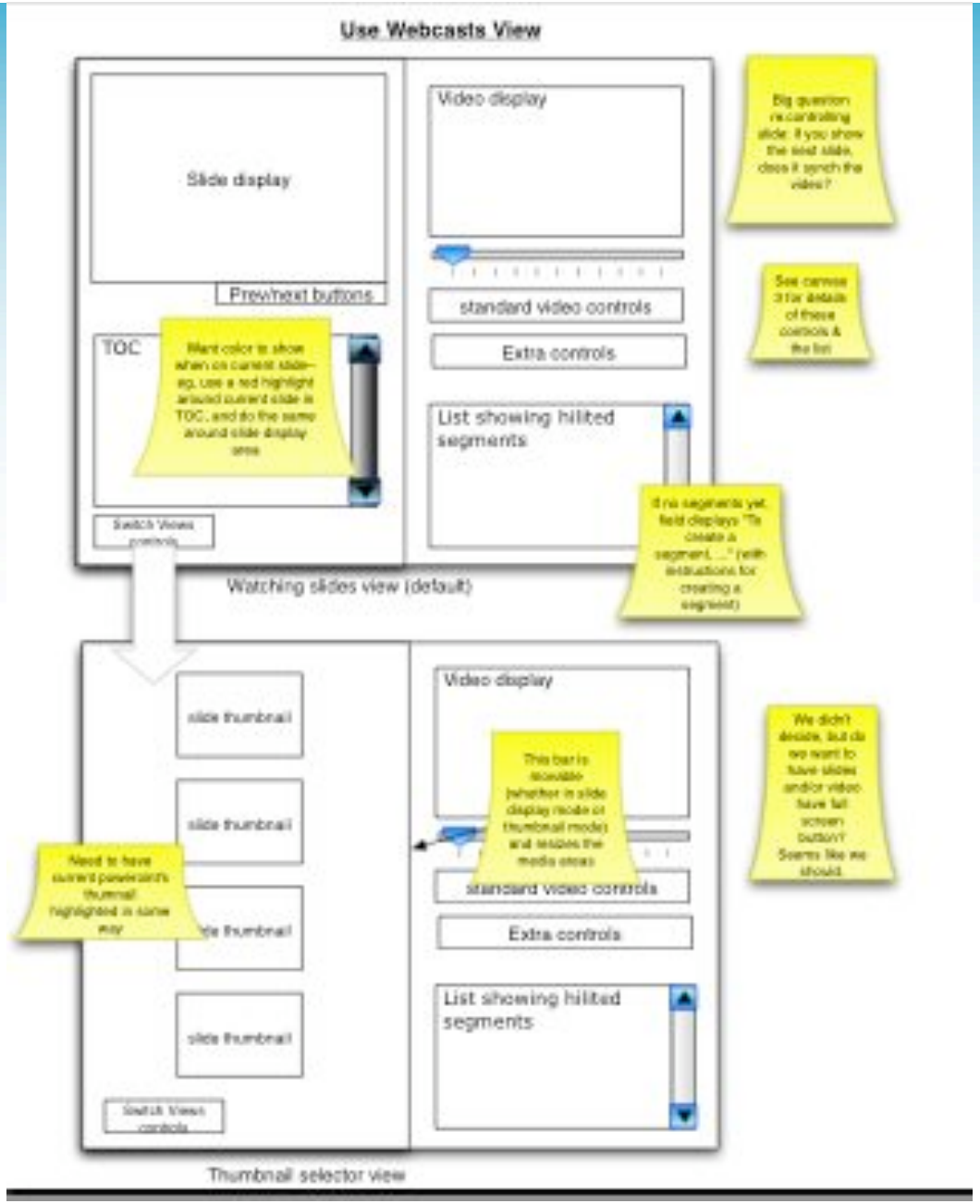
OR

- She picks the webcast (from the **Browse Lectures pane**) that she knows the slide is in, bSpace switches to the Use Webcast View and then Lisa uses the **switch slide views control** to switch the slides view to Thumbnails. She browses the **thumbnails** until she sees the right one and clicks on it.
- The webcast starts playing from the beginning of the slide.
- One sentence the instructor says seems to encapsulate the concept for her, so she decides to get it down word for word. She first uses the **Jump Back Incrementally button** to get to (near) the place the sentence starts. Since her prof talks fast and does not always use lay terms, she uses the **replay button** to relisten several times.
- After she feels like she understands, she adds some notes in the study sheet.
- She continues play, and as she does, she notices (by the **yellow highlight mark** on the timeline) that she's currently viewing a highlighted portion, and glances at the **highlighted segment browser** to see what the significance of the segment is.
- Since she can't get enough details, she mouses over the **yellow highlight mark** in the timeline and the full title and annotation pop up in place in a little window .
- She notices another segment in the highlighted segment browser and uses the **selection widget** to select it. As she watches, she adds more notes to her study sheet. Then she repeats the process for a few other segments in the list.
- She starts to summarize on her study sheet various protein structures, but she's feeling that there are some protein structures she still doesn't know, so she decides to review all the places in which the professor has talked about protein structures. She clicks the **Find link** (at the top of the bSpace window) and enters "protein structures" in the **search pane**, indicating that she wants the search to include PPT text, her own highlighted segments, and caption text. The search pane returns a list of results (including enough information to help her know which particular protein structures are covered).
- She sees one that covers a protein structures she's feeling weak on and clicks on it. bSpace switches to the Use Webcast View, opens the appropriate lecture and plays the part of the lecture indicated in the search results.
- Since there a few others in the search results she wanted, she clicks the **Find link** again. Her search results are still there, although there's an **indication of the one she already watched**. She repeats the process of watching and returning to the search results and watching another several times, adding to the section in her study sheet on protein structures.
- Then she remembers that her TA said that the professor from two semesters ago had explained mitosis really well. (The T.A. even told her which

Table of Needs and Elements

Need	Element
(see) Highlighted segments	marks to show highlighted segments
(see) Place left off	mark to show user where left off
(see) Chapters	mark to show beginning of chapter
(see) Lecture	pane(s) for video (potentially p-in-p)
highlight a segment	highlight start widget and highlight end widget
keep track of place left off	mark to show place left off
annotate areas of interest	field to type annotation in
jump to labeled segment	widget to select a segment
watch in fast motion while ff'ing [scrubbing]	time slider that allows for viewing slides while moving slider
turn captions on/off	toggle widget
(see) Powerpoint slide	pane to display current powerpoint slide
(see) visual of chalkboard diagram	pane for video
(see) points in lectures that cover topic x	pane to show search results
(see) Info about found points • slide title, picture of slide • segment title, keywords, annotation • caption text at that point	detail areas of search results pane
(see) Lecture titles	title area
(see) point at which she wants to start play	mark on the timeline
(see) words the instructor is saying	caption pane
(see) semester of webcast	Title area
(see) current time in webcast	time field
(see) when logistical stuff is over	mark in timeline
find webcast via class then lecture	browse lectures pane, [bspace: place where most recent lecture appears]
get to time in lecture where she noted confusion	way to enter lecture time
play video	play widget
stop video	stop and/or pause widget

Sketch of Interaction Framework



Next Steps

- Design (detailed, iterative)
- Development Support

Research Modeling Requirements Definition UI Framework Definition **Design** **Development Support**