Mobile App Design

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DESIGN

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The importance of Design

- Design: impose meaningful order
- Users' desires, needs, motivations, contexts
- Create products whose form, content, and behavior is
  - useful, usable, and desirable, as well as
  - economically viable and technically feasible

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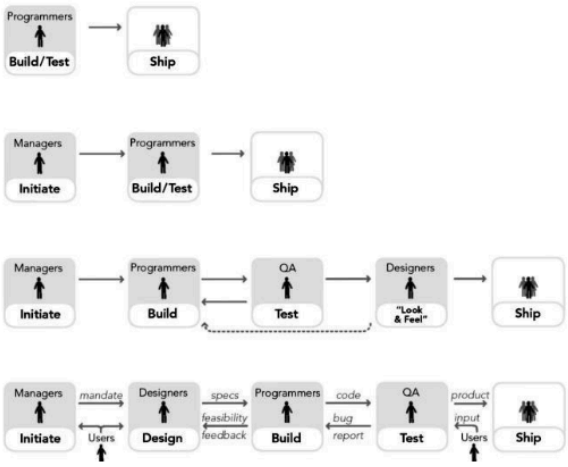
Evolution of Software Development



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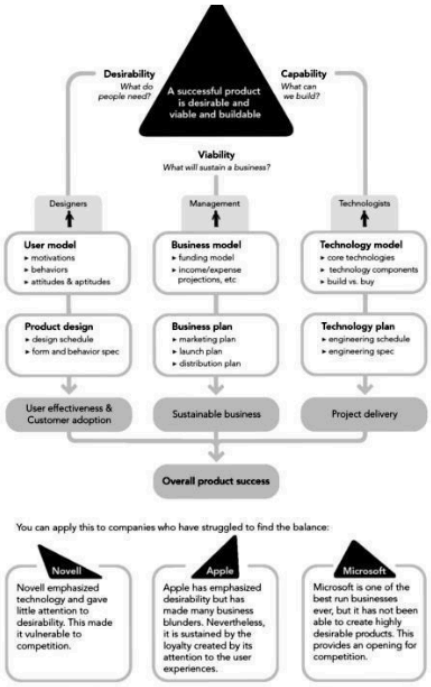

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Business Goals vs Personal Goals

- Too much emphasis on business goals
  - Make users feel stupid
  - Cause users to make mistakes
  - Require too much effort
  - Don’t provide engaging experience

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Goals vs Tasks & Activities

- Goal: Expectation of an end condition
- Norman: Activity-Centered Design (ACD)
  - Task-based focus lacks context
  - Hierarchy: Activities, tasks, actions, operations
- Cooper: Goal-Centered Design
  - What vs Why?
    - Taking a train
    - Getting to Washington DC
  - Goals motivate people to perform activities

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GOAL-DIRECTED DESIGN

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Research

- Observations
- Contextual interviews

- Behavior patterns
  - Business: professional roles
  - Consumer: lifestyle choices

- Drive the creation of *personas*

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Ethnographic interviews

- Avoid making the user a designer
- Avoid discussions of technology
- *Encourage storytelling*
- Ask for a show and tell
  - Grand tour of artifacts
- Avoid leading questions

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Modeling

- Information flows
- Workflow patterns

- Personas: composite user archetypes that represent distinct groupings of behaviors, attitudes, aptitudes, goals, and motivations

- Characters in narrative, scenario-based design

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Requirements Definition

- Scenario-based design, role-playing

- Focus on *goals and needs* of specific personas
  - Not on specific tasks

- Iteratively refined context scenario
  - "Day in the life"
  - Product touch points
  - Skills and physical capabilities

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Goal-Directed Design

- Who are my users?
- What are my users trying to accomplish?
- How do my users think about what they're trying to accomplish?
- What kind of experiences do my users find appealing and rewarding?
- How should my product behave?
- What form should my product take?
- How will users interact with my product?
- How can my product's functions be most effectively organized?
- How will my product introduce itself to first-time users?
- How can my product put an understandable, appealing, and controllable face on technology?
- How can my product deal with problems that users encounter?
- How will my product help infrequent and inexperienced users understand how to accomplish their goals?
- How can my product provide sufficient depth and power for expert users?

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MENTAL MODELS

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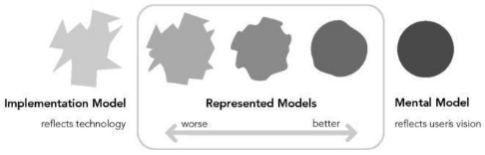
Models

- Implementation Model
  - Ex: motion pictures
  - Projector technology
  - Brain physiology
- Mental Model
  - User experience
- Represented model
  - Designer abstraction of what software does



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Models

- Design Principle: Goal-directed interactions reflect user mental models
- Abstract from implementation complexity
  - Simplified interaction
  - Ex: remotes for DVD, TV, cable

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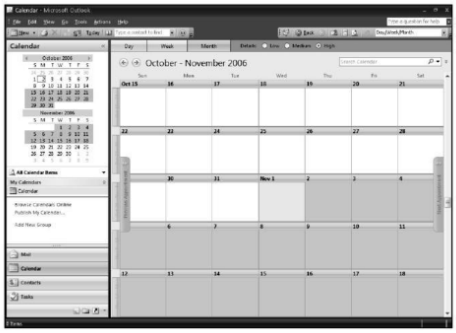
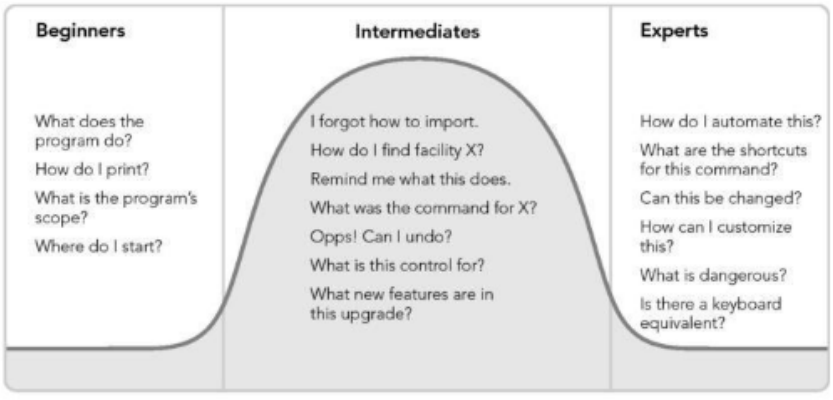
Models

- Design Principle: Don't replicate Mechanical-age artifacts in user interfaces without information-age enhancements



Classes of Users



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Classes of Users

- Beginners
  - Not stupid, just busy
  - Need guided tour, not help
- Experts
  - Influential
  - Need shortcuts
- Intermediates
  - Need access to tools (ToolTips)
  - Reference help
  - Tools in working set should be central in UI
  - Optimize for intermediates

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RESEARCH → **MODELING** → REQUIREMENTS → FRAMEWORK → REFINEMENT

MODELING USERS: PERSONAS AND GOALS

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Why Personas?

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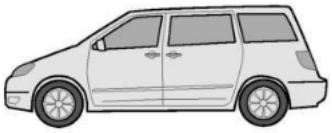
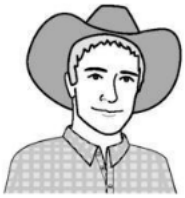
Alesandrois goals
- Go fast
- Have fun

Marge's goals
- Be safe
- Be comfortable





Dale's goals
- Haul big loads
- Be reliable

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Persona principles

- Based on research
- Represented as individual people
  - Empathy
- Represent groups of users
  - Encapsulate behavior patterns
  - Archetypes vs stereotypes
- Explore ranges of behavior
  - Persona set
- Must have motivations

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GOALS

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Goals and cognitive processing

- Visceral
  - Design for affect e.g. Angry Birds
  - Perception of usability
- Behavioral
  - Traditional focus of UI
  - Harmonize visceral, reflective aspects with this
- Reflective
  - Associate meaning and value with artifact

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Types of User Goals (1/3)

- Experience (visceral)
  - Feel smart or in control
  - Have fun
  - Feel cool or hip or relaxed
  - Remain focused and alert

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Types of User Goals (2/3)

- End Goals (behavior)
  - Be aware of problems before they become critical
  - Stay connected with friends and family
  - Clear my to-do list by 5:00 every day
  - Find music that I'll love
  - Get the best deal

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Types of User Goals (3/3)

- Life Goals (reflection)
  - Live the good life
  - Succeed in my ambitions to
  - Be a connoisseur of . . .
  - Be attractive, popular, or respected by my peers

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Non-user Goals

- Customer Goals
- Business and organizational goals
  - Increase profit
  - Retain customers
  - Educate the public
  - Raise enough money to cover overhead
- Technical goals
  - Run in a variety of browsers
  - Safeguard data integrity
  - Maintain consistency across platforms

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Most Important Goal

- Design Principle: Don't make the user feel stupid
- User goals should always come first

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CONSTRUCTING PERSONAS

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Identify behavioral variables

- Activities
  - What the user does
- Attitudes
  - About product domain and technology
- Aptitudes
  - Education, training, ability to learn
- Motivations
  - Why the user is engaged in the product domain
- Skills
  - User capabilities related to the product domain

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Expand description of attributes and behaviors

- From bullet points to third-person narrative
  - Persona job and lifestyle
  - A day in the life
  - Conclusion: What they want from the product
- Photographs
  - Contextual (nurse, clerk, etc)

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Example Persona

Nicolle - 34 Year Old Certified Hand Therapist from West Chicago, IL

"My downtime is precious; I make every spare moment count!"

Personal Background

Nicolle has been an Occupational Therapist for nearly a decade. She travels from her home in West Chicago to the city of Chicago via train daily for her job. She is married (Russ) and has two daughters ages 5 (Sydney) and 10 months (Avery) who occupy most of her time when she is not working.

Since downtime is truly a luxury for Nicolle, she likes to take advantage of her daily commute to keep up with the television series that she has purchased season passes for on iTunes. Her iPhone is her constant companion—she uses it to keep in touch with friends and family via email and text messages, but also uses it to keep up with her patient workload. In addition, she has her high-energy playlist ready to go for her lunchtime workouts at the gym in her building.

Nicolle enjoys the all-in-one aspect of her iPhone but does not like to be encumbered by the wires of her earbuds that seem to always get tangled in her pocket. She thinks that the small, single-ear Bluetooth headsets make people look self-important to the point of being ridiculous, so she is hesitant to even consider a Bluetooth option. She is looking for headphones to make her commuting lifestyle easier. As long as the right headset doesn't make her look silly and can function as headphones and a microphone for speaking into during phone calls, she could be persuaded to give them a try.

More About Nicolle

Motivators

Nicolle's standard iPhones ear buds cord continually gets tangled when stored in her pocket or caught up in her clothes and jacket when she's working out or walking to and from her office to the train station. It's a minor annoyance, but removing the annoyance would be very welcome.

ACMEblue Bluetooth Headset Trigger Point

Nicolle saw the ACMEblue on display at the Apple Store on Michigan Avenue in Chicago and decided to try them on. She liked them, but went online to Apple.com and Amazon.com to check-out the reviews online to further influence her decision.

Engagement & Activities

Personal Computer: High / Fluent; comfortable with common apps
Internet Usage: Medium / Fluent; not adventuresome, but has a personal blog, Flickr, YouTube for friends and family.
Mobile: High / Fluent; seeks new tools to help her day-to-day. Uses text messaging frequently, but not high volume.
Social Networking: Facebook & LinkedIn, no MySpace; she likes to stay in touch and aware of how her friends and professionals contacts are doing.
Television Shows: Biggest Loser, Scrubs, How I Met Your Mother, American Idol, Iron Chef and Ace of Cakes
Magazines: Stays current with Celebrity and Parenting periodicals.

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Designate Persona Types

- Primary personas
  - There can be only one
    - Per interface (e.g. clinical vs financial)
  - Design principle: Focus the design for each interface on a single primary persona
- Secondary personas
  - Can be satisfied with additional functionality
  - Warning sign

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SCENARIOS AND REQUIREMENTS

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Bridging research-design gap

- Develop stories or scenarios
- Use scenarios to define requirements
- Use requirements to define interaction framework
- Filling in framework with design detail
- Glue: narrative

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Bridging research-design gap

- Develop stories or scenarios
  - Personas = characters
- Use scenarios to define requirements
  - Plot points
- Use requirements to define interaction framework
  - Storyboards
- Filling in framework with design detail
  - Role-playing at a whiteboard
- Glue: narrative
  - Use personas to create stories that point to design

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Types of Scenarios

- Context Scenario
  - How product can serve persona needs
  - High level, written before design
  - Perspective of persona
- Key Path Scenario
  - With Design Framework, revise context scenario
  - Describe user interactions with product
- Validation scenarios
  - "what if …" testing of solutions

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Requirements: "What if…"

- Design Principle: Define what the product will do before you design how the product will do it
  - Requirement ≠ feature
  - Requirement = need
- Example: data analytics tool
  - Reproduce paper reporting system?
  - Or event-driven situational awareness

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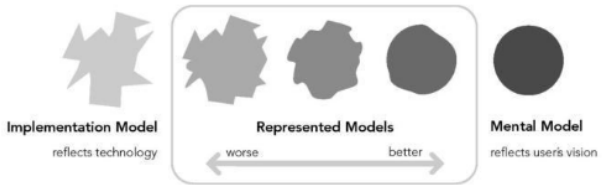
Identifying persona expectations

- Represented model must match user's mental model



  - What do the subjects mention first?
  - Which action words (verbs) do they use?
  - Which intermediate steps, tasks or objects in a process *don't* they mention?

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Constructing context scenarios

- Broad context of usage patterns
  - In what setting(s) will the product be used?
  - Will it be used for extended amounts of time?
  - Is the persona frequently interrupted?
  - With what other products will it be used?
  - What primary activities does the persona need to perform to meet her goals?
  - What is the expected end result of using the product?
  - How much complexity is permissible?

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Example Context Scenario

- Example: Viven Strong
  - Real-estate agent in Indianopolis
  - Goals:
    - Balance work and home life
    - Close the deal
    - Make each client feel like he is her only client

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Example Context Scenario (1/3)

1. While getting ready in the morning, Vivien uses her phone to check her e-mail. It has a large enough screen and quick connection time so that it's more convenient than booting up a computer as she rushes to make her daughter, Alice, a sandwich for school.
2. Vivien sees an e-mail from her newest client, Frank, who wants to see a house this afternoon. The device has his contact info, so now she can call him with a simple action right from the e-mail.
3. While on the phone with Frank, Vivien switches to speakerphone so she can look at the screen while talking. She looks at her appointments to see when she's free. When she creates a new appointment, the phone automatically makes it an appointment with Frank, because it knows with whom she is talking. She quickly enters the address of the property into the appointment as she finishes her conversation

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Example Context Scenario (2/3)

4. After sending Alice off to school, Vivien heads into the real-estate office to gather some papers for another appointment. Her phone has already updated her Outlook appointments, so the rest of the office knows where she'll be in the afternoon.
5. The day goes by quickly, and she's running a bit late. As she heads towards the property she'll be showing Frank, the phone alerts her that her appointment is in 15 minutes. When she flips open the phone, it shows not only the appointment, but a list of all documents related to Frank, including e-mails, memos, phone messages, and call logs to Frank's number. Vivien presses the call button, and the phone automatically connects to Frank because it knows her appointment with him is soon. She lets him know she'll be there in 20 minutes.
6. Vivien knows the address of the property but is a bit unsure exactly where it is. She pulls over and taps the address she put into the appointment. The phone downloads directions along with a thumbnail map showing her location relative to the destination.

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Example Context Scenario (3/3)

7. Vivien gets to the property on time and starts showing it to Frank. She hears the phone ring from her purse. Normally while she is in an appointment, the phone will automatically transfer directly to voicemail, but Alice has a code she can press to get through. The phone knows it's Alice calling, and uses a distinctive ring tone.
8. Vivien takes the call -Alice missed the bus and needs a pickup. Vivien calls her husband to see if he can do it. She gets his voicemail; he must be out of service range. She tells him she's with a client and asks if he can get Alice. Five minutes later the phone makes a brief tone Vivien recognizes as her husband's; she sees he's sent her an instant message: "I'll get Alice; good luck on the deal!”

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Context Scenario

- Design Principle: In early stages of design, *pretend the interface is magic*
  - Persona has goals
  - Product has magical powers to meet those goals
  - Essence of magic: meet goals with minimum of hassle and intrusion

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Identifying Requirements

- From context scenario, identify:
  - Objects
  - Actions
  - Contexts

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Identifying Requirements

- From context scenario, identify:
  - Objects
  - Actions
  - Contexts
- Ex: Call a person directly from an appointment

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Identifying Requirements

- Data Requirements
  - Objects and adjectives related to those objects
- Functional Requirements
  - Actions (translated into interface controls)

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RESEARCH → MODELING → REQUIREMENTS → **FRAMEWORK** → REFINEMENT

DESIGN FRAMEWORK

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Design Framework

- Interaction framework
  - Rough sketches of screens and behaviors
  - Storyboards
  - Scenarios
- Visual design framework
  - Detailed rendering of a single screen archetype
- Encourage discourse and revisions
  - Usability testing
  - E.g. CAD drawings for architectural drawings

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Interaction Framework

1. Define form factor, posture, and input methods
   - Form factor: physical device
   - Posture: user attention
   - Input methods

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Interaction Framework

2. Define functional and data elements
   - Example: Functional elements from Vivien scenario:
     - Voice activation (voice data associated with contact)
     - Assignable quick-dial buttons
     - Selecting a contact from a list
     - Selecting a contact from an e-mail header, appointment, or memo
     - Auto-assignment of a call button in appropriate context (for example, upcoming appointment)

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Interaction Framework

3. Determine functional groups and hierarchy
   - Group data and function elements according to persona flows
   - Views: primary screens
     - Based on initial context scenarios
   - Ex: view that incorporates calendar & contacts

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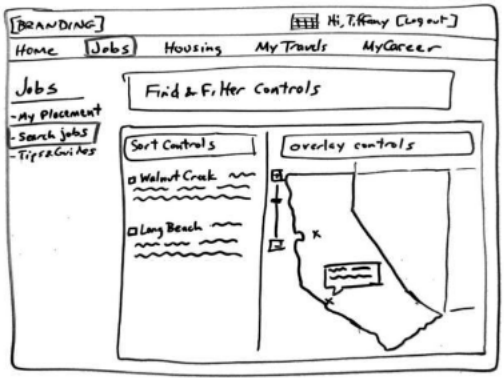
Interaction Framework

4. Sketch the interaction framework



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Interaction Framework

5. Construct key path scenarios
   - How person interacts with the product
   - Vocabulary of interaction framework
     - Data and functional elements
   - Primary pathways (greatest frequency)
   - Task oriented
   - Storyboarding

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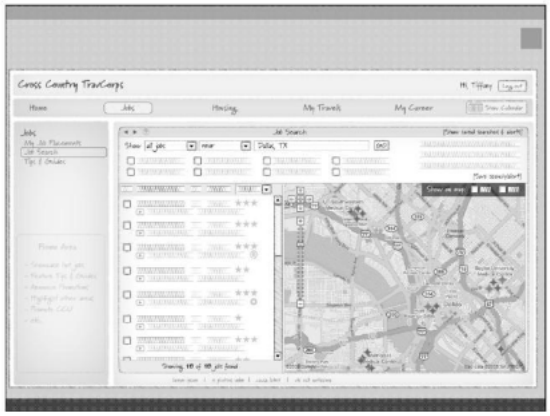
Interaction Framework

5. Construct key path scenarios
   - Storyboarding



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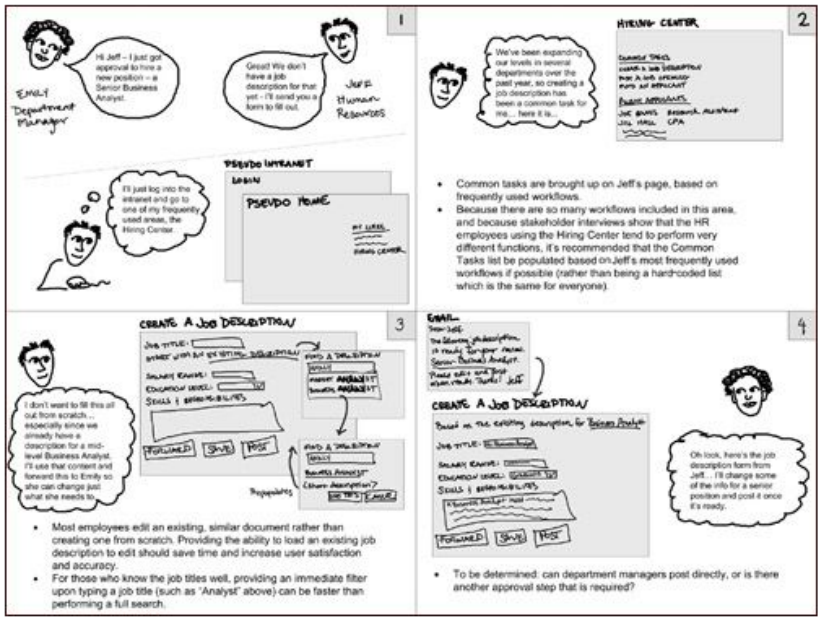

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Interaction Framework

6. Check designs with validation scenarios
   - "What if …" questions
   - Key path variant scenarios
     - The path less travelled
     - Ex: Viven responds to Frank by email instead of calling
   - Necessary use scenarios
     - Rare (e.g. hard reset) hence requires pedagogy
   - Edge use case scenarios
     - Important for correctness, not for usability
     - Ex: Vivien tries to add two different contacts with same name

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CONCLUSIONS

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Conclusions

- User interfaces should be based on user mental models
  - rather than implementation models
- Don't make the user feel stupid
- Focus the design for each interface on a single primary persona
- Define what the product will do before you design how the product will do it
- In early stages of design, pretend the interface is magic

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