Human Computer Interaction
From Idea to Design

Prof. Andrew D. Bagdanov

Dipartimento di Ingegneria dell'Informazione
Università degli Studi di Firenze
andrew.bagdanov AT unifi.it

November 28, 2017

Outline

News

News

Latest and Greatest

Remember, this Friday (December 1st) we will discuss the following article:

N. Cila, I. Smit, E. Giaccardi, B. Kröse, "Products as Agents: Metaphors for Designing the Products of the IoT Age." In: Proceedings of CHI, 2017.

Laboratory tomorrow

Functional Reactive Programming and Kivy `RecycleView`. NOTE: the laboratory will be in Aula 204!

Friday

On Friday we will take a final look at scenarios and how to identify and eliminate excise.

Overview

Overview

- Today we will see some practical techniques for pushing forward the design process.
- We have already seen how to use needfinding to identify concrete(-ish) needs for intervention.
- First, we will dive a bit deeper into how to build comprehensive personas to drive design forward.
- Then, we will see how to cast these personas into scenarios of their own.
- From these scenarios we will extract a reductive list of requirements for the interaction design.
- Much of the technique described in this lessen comes from:

  Alan Cooper, Robert Reimann, David Cronin. About Face 3: The Essentials of Interaction Design. Wiley, 2007.

Personas and Goals

Personas and Goals

- We have already talked about personas and how they provide us a way of thinking and communicating about how users behave, how they think, what they wish to accomplish, and why.
- Personas are composite archetypes based on behavioral data gathered from the many actual users.
- With personas we develop an understanding of user goals in context – and thus exploit user research to inform and justify our designs.
- Personas are simple in concept but must be applied with considerable sophistication.
- It is not enough to quickly generate a few profiles based on stereotypes and generalizations.
- For personas to be effective tools for design, rigor must be applied to identifying significant and meaningful patterns in user behavior.

Personas

- To create a product satisfying a diverse audience of users, it is tempting to think it must be as broad in functionality as possible.
- This logic is flawed: the way to user diversity is to design for specific types of individuals with specific needs.
- When you broadly and arbitrarily extend a product's functionality, you increase the cognitive load and navigational overhead for all users.
- Facilities that may please some users will likely interfere with the satisfaction of others.
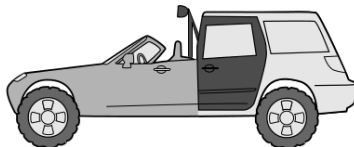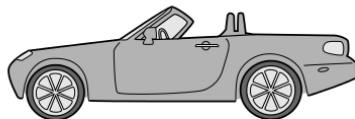
Personas: power in diversity

- The key to the persona approach is first to choose the right individuals to design for.
- These should be users whose needs best represent the needs of a larger set of key constituents.
- Personas are powerful for communicating about different types of users and their needs, then deciding which users are the most important to target in the design of form and behavior.

Alesandro's goals
▸ Go fast
▸ Have fun

Personas: power in diversity

- The key to the persona approach is first to choose the right individuals to design for.
- These should be users whose needs best represent the needs of a larger set of key constituents.
- Personas are powerful for communicating about different types of users and their needs, then deciding which users are the most important to target in the design of form and behavior.

Marge's goals
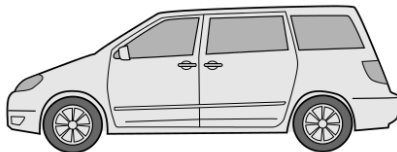▸ Be safe
▸ Be comfortable

Personas: power in diversity

- The key to the persona approach is first to choose the right individuals to design for.
- These should be users whose needs best represent the needs of a larger set of key constituents.
- Personas are powerful for communicating about different types of users and their needs, then deciding which users are the most important to target in the design of form and behavior.

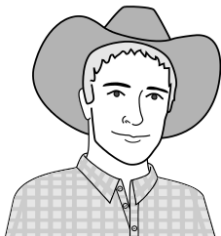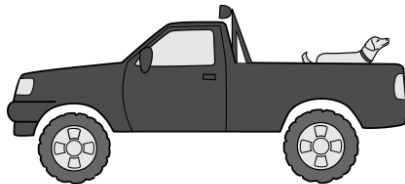Dale's goals
- Haul big loads
- Be reliable

The strength of personas as design tool

- The persona is a powerful, multipurpose design tool that helps overcome several problems that currently plague the development of digital products.
- Personas help designers:
    - Determine what a product should do and how it should behave. Persona goals and tasks provide the foundation for the design effort.
    - Communicate with stakeholders, developers, and other designers. Personas provide a common language for discussing design decisions and also help keep the design centered on users at every step in the process.
    - Build consensus and commitment to the design. With a common language comes a common understanding. Personas reduce the need for elaborate diagrammatic models.
    - Measure the design's effectiveness. Design choices can be tested on a persona in the same way that they can be shown to a real user during the formative process. This doesn't replace the need to test with real users, but it does provide a powerful reality-check.
    - Contribute to other product-related efforts such as marketing and sales plans.
- Personas also can resolve three design issues that arise during product development: the elastic user, self-referential design, and edge cases.

Problem: The Elastic User

- Although satisfying users is our goal, the term user causes trouble when applied to specific design problems.
- Its imprecision makes it dangerous as a design tool – every team member has his conception of who the user is and what they need.
- When it comes time to make decisions, this "user" becomes elastic.
- Designing for the elastic user gives the development team license to build what it pleases, while still apparently serving "the user."

Problem: Self-referential Design

- Self-referential design is when designers project their own goals and mental models onto a design.
- Many "cool" product designs fall into this category: the audience doesn't extend beyond people like the designer.
- Similarly, programmers apply self-referential design when they create implementation-model products.
- An implementation-model product is a product whose model is the actual implementation.
- Programmers understand perfectly how data is structured and how software works – and are comfortable with such products.
- Few non-programmers would concur.

Problem: Designing for Edge cases

- Personas also help prevent designing for edge cases – situations that might happen, but usually won't for the target personas.
- Typically, edge cases must be designed and programmed for, but they should never be the design focus.
- Personas provide a reality check for the design: we can ask, "Will Julie want to perform this operation very often? Will she ever?"
- With this knowledge, we can prioritize functions with great clarity.
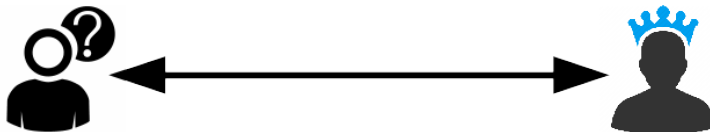
Goals

- If personas provide the context for sets of observed behaviors, goals are the drivers behind those behaviors.
- A persona without goals can still serve as a useful communication tool, but it lacks utility as a design tool.
- The function and behavior of the product must address goals via tasks – typically, as few tasks as absolutely necessary.
- Tasks are only a means to an end, while goals are that end.
- The goals of our personas motivate them to behave the way they do: they not only provide an answer to why and how personas desire to use a product.

User goals and cognitive processing

- Don Norman's book *Emotional Design* introduced the idea that product design should address three different levels of cognitive and emotional processing:
    - Visceral: the most immediate level of processing, in which we react to visual and other sensory aspects of a product that we can perceive before significant interaction occurs. Visceral processing helps us make rapid decisions about what is good, bad, safe, or dangerous.
    - Behavioral: the middle level of processing that lets us manage simple, everyday behaviors which constitute the majority of human activity. Norman claims that, historically, interaction design and usability practices have nearly exclusively addressed this level of cognitive processing.
    - Reflective: the least immediate level of processing, which involves conscious consideration and reflection on past experiences.

Designing for Visceral Responses

- Designing for the visceral level means designing what the senses initially perceive, before any deeper involvement with a product.
- For most of us, that means designing visual appearance, but there are other factors – think of the distinctive Mac power-up chord.
- A misconception often arises with visceral-level design: that designing for visceral response is about designing beautiful things.
- Battlefield software and radiation-therapy systems are just two examples where designing for beauty may not be the proper focus.
- Visceral design is actually about designing for affect.
- We can learn a great deal about affect from architecture, the cinema and stage, and industrial design.

Designing for Behavior

- Designing for the behavioral level means designing product behaviors that complement a user's own behaviors, implicit assumptions, and mental models.
- Getting design of behavior right provides our greatest opportunity for positively influencing the way users construct their experience with products.
- Not following this line of reasoning can lead to the problem of initial impressions being out of sync with reality.
- The user experience of a product should ideally harmonize elements of visceral design and reflective design with a focus on behavioral design.

Designing for Reflection

- Reflective processing is perhaps the most challenging aspect of the three levels of processing that Norman discusses.
- Designing for the reflective level means designing to build long-term product relationships.
- In describing reflective design, Norman uses several high-concept designs for commodity products as examples (such as impractical teapots).

Designing for Reflection
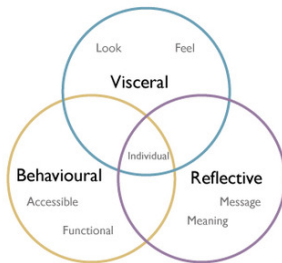
- It is more difficult to see how products that serve useful purposes need to balance the stylistic and the elegant with the functional.

- The Apple iPod comes very close to achieving this balance: the user's visceral reaction to its click-wheel interface is tremendous due to its elegant industrial design.

- Its reflective potential is also significant, because of the emotional connection between people and their music.

- Few products become iconic in people's lives in the way that the Sony Walkman or the iPod has.

- When the design of a product or service addresses user goals and motivations, the opportunity for the creation of reflective meaning is greatly enhanced.

Three Types of User Goals

- In *Emotional Design*, Norman presents his three-level theory of cognitive processing and discusses its potential importance to design.

- However, Norman does not suggest a method for systematically integrating his model of cognition and affect into the practice of design.

- The key lies in properly delineating and modeling three specific types of user goals as part of each persona definition.

- Three types of user goals correspond to Normans visceral, behavioral, and reflective processing levels: experience goals, end goals, and life goals.

User Experience Goals

- Experience goals are simple, universal, and personal.
- Paradoxically, this makes them difficult for many people to talk about – especially in the context of impersonal business.
- Experience goals express how someone wants to feel while using a product or the quality of their interaction with the product.
- These goals provide focus for visual and aural characteristics, its interactive feel such as animated transitions, latency, etc.
- Some persona goals express themselves at the visceral level, for example a user might want to:
  - Feel smart or in control
  - Have fun
  - Feel cool or hip or relaxed
  - Remain focused and alert
- When products make users feel stupid or uncomfortable, their self-esteem drops and their effectiveness plummets.

User End goals

- End goals represent user motivation for performing tasks using a specific product.
- When you open a document, you likely have an outcome in mind.
- These goals are the focus interaction design and information architecture.
- Because behavioral processing influences both visceral and reflective responses, end goals are among the most important in determining the overall product experience.
- Examples of end goals include:
  - 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.

User Life goals

- Life goals represent personal aspirations that go beyond the context of the product being designed.
- For example:
  - Live the good life.
  - Succeed in my ambitions to. . .
  - Be a connoisseur of. . .
  - Be attractive, popular, or respected by my peers.
- We must translate life goals into high-level system capabilities, formal design concepts, and brand strategy.
- Life goals rarely lead to design of specific elements or behaviors of an interface.
- However, they are worth keeping in mind: a product that takes a user closer to his life goals, and not just his end goals, will win him over more decisively than any marketing campaign.

Constructing Personas

- Our goal in finding a set of personas is to represent the diversity of observed motivations, behaviors, attitudes, mental models, workflows, and frustrations with current products or systems.
- Creating believable and useful personas requires an equal measure of detailed analysis and creative synthesis.
- A standardized process aids both of these activities significantly.
- The principle steps are:
  1. Identify behavioral variables.
  2. Map interview subjects to behavioral variables.
  3. Identify significant behavior patterns.
  4. Synthesize characteristics and relevant goals.
  5. Check for redundancy and completeness.
  6. Expand description of attributes and behaviors.
  7. Designate persona types.

Step 1: Identifying behavioral variables

- After completing our research, we list the distinct aspects of observed behavior as a set of behavioral variables.

- Demographic variables such as age or geographic location may seem to affect behavior, but it is dangerous to focus on them because behavioral variables will be far more useful.

- Generally, the most important distinction between behavior patterns emerges by focusing on the following types of variables:
  - Activities: What the user does; frequency and volume.
  - Attitudes: How the user thinks about the product domain and technology.
  - Aptitudes: What education and training the user has; capability to learn.
  - Motivations: Why the user is engaged in the product domain.
  - Skills: User capabilities related to the product domain and technology.

Step 2: Mapping subjects to variables

- After identifying the set of significant behavioral variables exhibited by your interview subjects, the next step is to map each subject against each variable.
- Some of these variables will be a continuous range of behavior (e.g. from computer novice to a computer expert), and a others multiple discrete choices (e.g. uses a digital camera versus uses a film camera).
- Mapping the interviewee to a precise point in the range isn't as critical as identifying interviewees in relationship to each other.
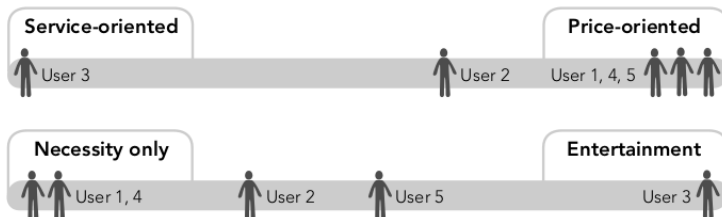
Step 3: Identifying behavior patterns

- After mapping interview subjects, we look for clusters of subjects that occur across multiple ranges or variables.
- A set of subjects who cluster in a majority of variables will likely represent a significant behavior pattern (a persona).
- For a pattern to be valid there must be a logical connection between the clustered behaviors, not just a spurious correlation.
- Example: there is a clear connection people who purchase CDs also download MP3s, but there is probably no logical connection if the data shows that interviewees who purchase CDs online are often vegetarians.

Step 4: Synthesize characteristics and goals

- For each significant behavior pattern, we then synthesize details from data: potential use environment, typical workday, current solutions and frustrations, and relationships with others.
- A description or two that sharpens personas can help bring them to life – but too much fictional, idiosyncratic biography is a distraction and makes personas less credible.
- It sometimes makes sense for the set of personas for a product to be part of the same family or corporation and to have interpersonal or social relationships with each other.
- Think about:
  1. Whether you observed any behavioral variations in your interview subjects related to variations in company size, industry, or family/social dynamic.
  2. If it is critical to illustrate workflow or social interactions between coworkers or members of a family or social group.

Step 5: Completeness and redundancy

- At this point we now should should check mappings and persona characteristics and goals to see if there are any important gaps.
- If you find that two personas seem to vary only by demographics, you may choose to eliminate one of the redundant personas or adjust characteristics of your personas to make them more distinct.
- Each persona must vary from all others in at least one significant behavior.
- By making sure the persona set is complete and meaningfully distinct, we ensure that personas represent the diversity of behaviors and needs in the real world.
- This also guarantees as compact a design target as possible, which reduces work when you begin designing interactions.

Step 6: Expand attributes and behaviors

- The "bullet point" characteristics and goals arrived at in Step 4 point to the essence of complex behaviors, but leave much implied.

- Third-person narrative is far more powerful at conveying the persona's attitudes, needs, and problems to others.

- A typical persona description should be a synthesis of the most important details observed during research.

- The best narrative quickly introduces the persona in terms of his job or lifestyle, and including peeves, concerns, and interests that have direct bearing on the product.

- Details should be an expansion of your list of characteristics, with additional data derived from your observations and interviews.

Step 7: Designate persona types

- Personas should now feel very much like a set of real people whom you know.
- Design requires a target – the audience upon whom the design is focused – and the more specific the target, the better.
- Trying to create a design solution that simultaneously serves the needs of even three or four personas can be overwhelming.
- What we then must do is prioritize our personas to determine which should be the primary design target.
- The goal is to find a single persona whose needs and goals can be happily satisfied by a single interface without disenfranchising any of the other personas.
- There are six types of persona, in this order: Primary, Secondary, Supplemental, Customer, Served, Negative.

Step 7: Primary personas

- These the primary target for the design of an interface.
- There can be only one primary persona per interface, but some products will have multiple distinct interfaces, each targeted at a distinct primary persona.
- For example, a health-care information system might have separate clinical and financial interfaces, each targeted at a different persona.
- Note that interface is used in an abstract sense here.
- Choosing the primary persona is a process of elimination: each persona must be tested by comparing the goals of that persona against goals of the others.
- If no clear primary persona is evident, it could mean one of two things: either the product needs multiple interfaces, or the product is trying to accomplish too much.

Step 7: Secondary and Supplemental personas

Secondary personas

- A secondary persona is mostly satisfied with the primary persona's interface, but has specific additional needs that can be accommodated without upsetting the ability to serve the primary persona.
- We do not always have a secondary persona, and more than three or four can be a sign that the scope is too large and unfocused.
- As you work through solutions, your approach should be: design for the primary, then adjust to accommodate the secondary.

Supplemental personas

- Personas that are not primary or secondary are supplemental personas.
- They are often "political" personas representing stakeholder needs.
- Their needs are a combination of primary and secondary personas.
- There can be any number of supplemental personas.

Step 7: Customer and Served personas

Customer personas (BOFH)

- Customer personas address the needs of customers, not end users.
- Typically, customer personas are treated like secondary personas.
- However, in some environments, some customer personas may be primary personas for their own administrative interface.

Served personas (passive personas)

- They are not users of the product at all, however they are directly affected by the use of the product.
- A patient being treated by a radiation therapy machine is not a user of the machine's interface, but she is served by a good interface.
- Served personas are treated as secondary or supplemental.

Step 7: Negative personas

- Negative personas are used to communicate to stakeholders and product team members that there are specific types of users that the product is not being built to serve.

- Their use is purely rhetorical: to help communicate to others that a persona should definitely not be the design target for the product.

- Good candidates for negative personas are often technology-savvy early adopter personas.

- And this gem of a suggestion, people, is why we as engineers are destined to be *dissatisfied* with most interface designs.

Scenarios and Requirements

Scenarios and Requirements

- Through careful analysis of user research and synthesis of personas, we create a clear picture of our users and their respective goals.

- We now come to the crux of the whole method: how to use this understanding of people to create design solutions that satisfy and inspire users.

- We must employ personas as the main characters in a set of techniques that arrive at design solutions in an iterative, repeatable, and testable fashion.

- This process has four major activities:
  - Developing scenarios as a means of imagining ideal user interactions.
  - Using those scenarios to define requirements.
  - Using these requirements in turn to define the fundamental interaction framework for the product.
  - And filling in the framework with increasing amounts of design detail.

Scenarios: Narrative as a Design Tool

- Storytelling is one of the oldest human activities, and much has been written about the power of narrative to communicate ideas.
- Because interaction design deals with behavior occurring over time, a narrative structure is perfectly suited for representing and validating interaction concepts.
- Interaction design narratives are similar to the storyboards used in the motion picture industry: they have a plot, and they are concise.
- Just as storyboards breathe life into a movie script, design solutions should be created and rendered to follow a plot.

Scenarios in design
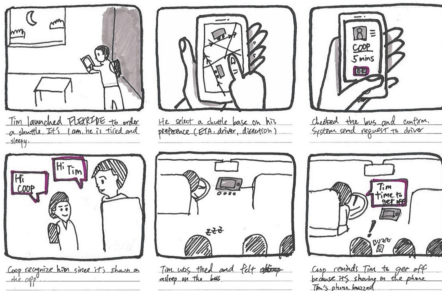
- In the 1990s, much work was done by the HCI community around the idea of use-oriented software design.
- From this work came the concept of the scenario: making use of a specific story to both construct and illustrate design solutions.
- John Carroll writes, in his book *Making Use*:

Scenarios are paradoxically concrete but rough, tangible but flexible . . . they implicitly encourage "what-if?" thinking among all parties. They permit the articulation of design possibilities without undermining innovation . . . Scenarios compel attention to the use that will be made of the design product. They can describe situations at many levels of detail, for many different purposes, helping to coordinate various aspects of the design project.

Using personas in scenarios

- **Persona-based scenarios** are concise narrative descriptions of one or more personas using a product to achieve specific goals.
- With them, we start our designs with an ideal experience, focusing on people rather than on technology or business goals.
- Goals serve as a filter for tasks and as guides for structuring the display of information and controls during the iterative process of constructing the scenarios.
- Designers role-play personas as the characters in these scenarios.
- This process leads to synthesis of structure and behavior and later informs the detailed look-and-feel.
- Personas and scenarios are also used to test the validity of design ideas and assumptions throughout the process.

Different types of scenarios

The Context Scenario

- The context scenario is used to explore, at a high level, how the product can best serve the needs of the personas.
- These scenarios are created before any design and are written from the perspective of the persona, focused on human activities, perceptions, and desires.
- It is in the development of this kind of scenario that the designer has the most leverage to imagine an ideal user experience.

The Key Path Scenario

- After designing functional and data elements, a context scenario is revised to become a key path scenario by more specifically describing user interactions and introducing the vocabulary of the design.
- These scenarios focus attention on how a persona uses the product to achieve their goals.
- Key path scenarios are iteratively refined along with the design as more and more detail is developed.

Requirements: The "What" of Design

- The Requirements Definition phase determines the what of the design: what information and capabilities our personas require to accomplish their goals.

- It is absolutely critical to define and agree upon the what before we move on to the next question: how the product looks, behaves, operates, and feels.

- Many designers are tempted to jump right into active design and render possible solutions.

- Conflating these two questions is one of the biggest pitfalls in the design of an interactive product.

Requirements Definition Using Personas and Sc

- The Requirements Definition process for interaction design consists the following five steps:
  1. Creating problem and vision statements
  2. Brainstorming
  3. Identifying persona expectations
  4. Constructing context scenarios
  5. Identifying requirements
- Although these steps proceed in roughly chronological order, they are an iterative process.
- Expect to cycle through Steps 3 through 5 several times until the requirements are stable.

Step 1: Problem and Vision Statements

- It's important for designers to have a clear mandate for moving forward.
- At this point we already have a sense of which users we're targeting and what their goals are, but how do we know when to design?
- Problem and vision statements provide just such a mandate and help build consensus among stakeholders before the design process moves forward.
- A design problem statement should concisely reflect a situation that needs changing:

  ACME's customer satisfaction ratings are low and market share has diminished by 10% over the past year because users dont have adequate tools to perform X, Y, and Z tasks that would help them meet their goal of G.

Step 1: Problem and Vision Statements

- The vision statement is an inversion of the problem statement that serves as a high-level design objective or mandate.
- In the vision statement, you lead with the user's needs, and you transition from those to how business goals are met by design vision.
- The content of both the problem and vision statements should come directly from research and user models.

The new design of Product X will help users achieve G by giving them the ability to perform X, Y, and Z with greater [accuracy, efficiency, and so on], and without problems A, B, C that they currently experience. This will dramatically improve ACME's customer satisfaction ratings and lead to increased market share.

Step 2: Brainstorming

- At the early stage of Requirements Definition, brainstorming assumes a somewhat ironic purpose.
- We have been researching and modeling users, so, it is almost impossible to avoid having developed some preconceptions about what the solution looks like.
- The reason we brainstorm at this point in the process is to get these ideas out of our heads.
- A side benefit of brainstorming is to switch our brains into solution mode.
- Much of the work performed in the Research and Modeling phases is analytical in nature, and it takes a different mindset to come up with inventive designs.

Step 3: Identifying persona expectations

- Mental models are deeply ingrained and are the result of a lifetime of experience.
- Expectations about a product and the way it works are highly informed by their mental model.
- It's critical that the model of the interface match the user's mental model rather than reflecting the implementation model.
- To accomplish this, for each primary and secondary persona we identify:
  - Attitudes, experiences, aspirations, and other social, cultural, environmental, and cognitive factors that influence the persona's expectations.
  - General expectations and desires the persona may have about the experience of using the product.
  - Behaviors the persona will expect or desire from the product.
  - How that persona thinks about basic elements or units of data.

Step 4: Constructing context scenarios

- Though all scenarios are stories about people and their activities, context scenarios are the most storylike of the three types we employ.
- The focus is on the persona's activities, as well motivations and mental model.
- Context scenarios describe the broad context in which usage patterns are exhibited.
- This is where design begins: as you develop context scenarios, you should be focusing on how the product you are designing can best help your personas achieve their goals.
- Context scenarios address questions such as:
  - In what setting(s) will the product be used?
  - Will it be used for extended amounts of time?
  - Is the persona frequently interrupted?
  - Are there multiple users on a single workstation or device?
  - With what other products will it be used?
  - What activities does the persona need to perform to meet goals?
  - What complexity is allowed, based on persona skill and frequency of use?

An example Context Scenario

- The following is a first iteration of a context scenario for a primary persona for a personal digital assistant (PDA).
- Our persona is: Vivian Strong, a real-estate agent in Indianapolis, whose goals are to balance work and home life, close the deal, and make each client feel like he is her only client.
- Vivian's context scenario:
  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.

An example Context Scenario (continued)

④ After sending Alice off to school, Vivian 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 Franks number. Vivian presses the call button, and the phone automatically connects to Frank because it knows her appointment with him is soon. She lets him know shell be there in 20 minutes.

⑥ Vivian 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.

An example Context Scenario (continued)

7. Vivian 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 its Alice calling, and uses a distinctive ring tone.

8. Vivian 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 shes with a client and asks if he can get Alice. Five minutes later the phone makes a brief tone Vivien recognizes as her husbands; she sees hes sent her an instant message: "Ill get Alice; good luck on the deal!"

- Notice how the scenario remains at a fairly high level, without getting too specific about interfaces or technologies.
- Also notice how the activities in the scenario tie back to Vivian's goals.

Step 5: Identifying Requirements

- When satisfied with an initial draft of a context scenario, you can analyze it to extract persona needs or requirements.

- These requirements can be thought of as consisting of objects, actions, and contexts.

- A need from the scenario above might be:

  Call (action) a person (object) directly from an appointment (context).

- It can also be helpful to separate needs into data and functional requirements, as described in the following.

Step 5: Types of Requirements

Data requirements

- Persona data needs are the objects and information that must be represented in the system.
- It is often useful to think of data requirements as the objects and adjectives related to those objects.
- Common examples: accounts, people, documents, messages, songs, images, as well as attributes of those such as status, dates, size, creator, subject, and so on.

Functional requirements

- Functional needs are the operations or actions that need to be performed on the objects of the system and which are typically translated into interface controls.
- These can be thought of as the actions of the product.
- Functional needs also define places or containers where objects or information in the interface must be displayed.

Step 5: Other Requirements

- Its important to get a firm idea of the realistic requirements of the business and technology you are designing for.
- Other requirements can include:
  - Business requirements can include development timelines, regulations, pricing structures, and business models.
  - Brand and experience requirements reflect attributes of the experience you would like users and customers to associate with your product, company, or organization.
  - Technical requirements can include weight, size, form factor, display, power constraints, and software platform choices.
  - Customer and partner requirements can include ease of installation, maintenance, configuration, support costs, and licensing agreements.

Onward

Going forward with the design

Where we are now

- Having performed the steps described here, we have a rough, creative overview of the product and how it addresses user goals in the form of context scenarios.
- We also have a reductive list of needs and requirements extracted from research, user models, and the scenarios.
- Now we can go deeper into the details of product behaviors, and begin to consider how the product and its functions will be represented.
- You are ready to define the framework of the interaction.

Where we are going

- On Friday we will talk about:
  1. Establishing an interaction framework for our design.
  2. Synthesizing good design into implementation.
  3. Platform and posture considerations.

Homework

Exercise 19.1: Thinking about personas

If you already have a project in mind, start thinking about what some of the personas in your project might be. Who are they? What goals do they have?

Exercise 19.2: Thinking about scenarios

After hypothesizing different personas, think about how to cast these personas into context scenarios of their own.

Exercise 19.3: Thinking about requirements

For your hypothetical project, perform some brainstorming to generate ideas for your scenarios and personas. Then, try to write down some data, functional, and other requirements.