ABOUT FACE 2.0

THE ESSENTIALS OF INTERACTION DESIGN

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International
Bestseller
Completely revised
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About Face 2.0

The Essentials of Interaction Design

Alan Cooper and Robert Reimann

Chapter 5

Modeling Users: Personas and Goals

The most powerful tools are simple in concept, but must be applied with some sophistication. The most powerful interaction design tool used by the authors is simple on the surface: *a precise descriptive model of the user, what he wishes to accomplish, and why*. The sophistication becomes apparent in the way we construct and use that model.

These user models, which we call **personas**, are not real people, but they are based on the behaviors and motivations of real people and represent them throughout the design process. They are *composite archetypes* based on behavioral data gathered from many actual users through ethnographic interviews. We *discover* our personas during the course of the Research phase and formalize them in the Modeling phase. By understanding our personas, we achieve an understanding of our users' goals in specific contexts — a critical tool for translating user data into design frameworks.

There are many useful models that can serve as tools for the interaction designer, but the authors feel that personas are among the strongest. This chapter focuses on personas and goals and the process for creating personas; other models are briefly considered at the end of the chapter.

Why Model?

Models are used extensively in design, development, and the sciences. They are powerful tools for representing complex structures and relationships for the purpose of better understanding or visualizing them. Without models, we are left to make sense of unstructured, raw data, without the benefit of the big picture or any organizing principle. Good models emphasize the salient features of the structures or relationships they represent and de-emphasize the less significant details.

Because we are designing for users, it is important that we can understand and visualize the salient aspects of their relationships with each other, with their social and physical environments, and of course, with the products we hope to design.

Just as physicists create models of the atom based on raw, observed data and intuitive synthesis of the patterns in their data, so must designers create models of users based on raw, observed behaviors and intuitive synthesis of the patterns in the data. Only after we formalize such patterns can we hope to systematically construct patterns of interactions that smoothly match the behaviors, mental models, and goals of users. Personas provide this formalization.

Personas

To create a product that must satisfy a broad audience of users, logic tells you to make it as broad in its functionality as possible to accommodate the most people. *This logic, however, is flawed.* The best way to successfully accommodate a variety of users is to design for *specific types of individuals with specific needs*.

When you broadly and arbitrarily extend a product's functionality to include many constituencies, 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 (see Figure 5-1).
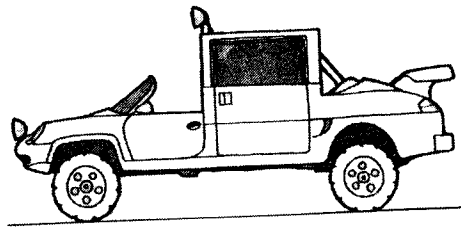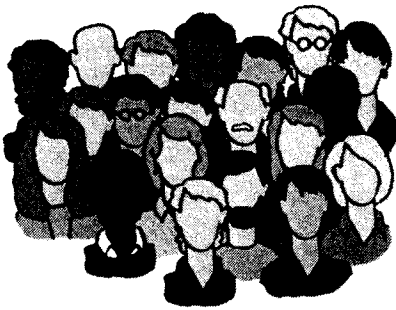
Figure 5-1: A simplified example of how personas are useful. If you try to design an automobile that pleases every possible driver, you end up with a car with every possible feature, but which pleases nobody. Software today is too often designed to please too many users, resulting in low user satisfaction. Figure 5-2 provides an alternative approach.

The key is in choosing the right individuals to design for, ones whose needs represent the needs of a larger set of key constituents (see Figure 5-2), and knowing how to prioritize design elements to address the needs of the most important users without significantly inconveniencing secondary users. Personas provide a powerful tool for understanding user needs, differentiating between different types of users, and prioritizing which users are the most important to target in the design of function and behavior.
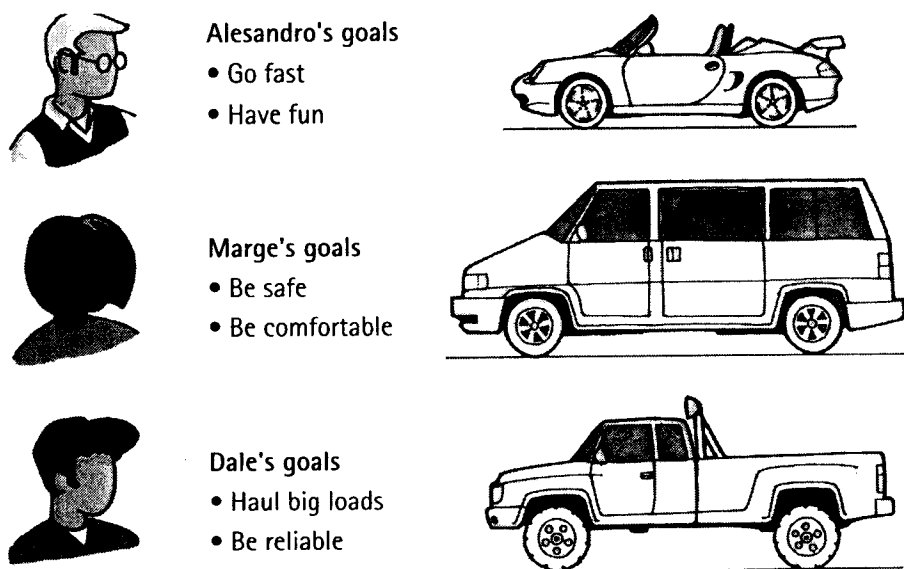
Since they were introduced as a tool for user modeling in *The Inmates Are Running The Asylum* (Cooper, 1999), personas have gained great popularity in the usability community, but they have also been the subject of some misunderstandings. This section attempts to clarify and explain in more depth some of the concepts and the rationale behind personas.

Strengths of personas as a 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 basis 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 because, as the authors have found, it is easier to understand the many nuances of user behavior through the narrative structures that personas employ.

✓ **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. Although this doesn't replace the need to test on real users, it provides a powerful reality check tool for designers trying to solve design problems. This allows design iteration to occur rapidly and inexpensively at the whiteboard, and it results in a far stronger design baseline when the time comes to test with real users.

✓ **Contribute to other product-related efforts** such as marketing and sales plans. The authors have seen their clients repurpose personas across their organization, informing marketing campaigns, organizational structure, and other strategic planning activities. Business units outside of product development desire sophisticated knowledge of a product's users and typically view personas with great interest.

Alesandro's goals
• Go fast
• Have fun

Marge's goals
• Be safe
• Be comfortable

Dale's goals
• Haul big loads
• Be reliable

Figure 5-2: A simplified example of how personas are useful. By designing different cars for different people with different specific goals, we are able to create designs that other people with similar needs to our target drivers also find satisfying. The same holds true for the design of digital products and software.

Personas also resolve three user-centered design issues that arise during product development:

✓ The elastic user

✓ Self-referential design

✓ Design edge cases

We discuss each of these briefly in the following sections.

THE ELASTIC USER

Although satisfying the user is our goal, the term *user* causes trouble when applied to specific design problems and contexts. Its imprecision makes it unusable as a design tool — every person on a product team has his own conceptions of the user and what the user needs. When it comes time to make product decisions, this "user" becomes *elastic*, bending and stretching to fit the opinions and presuppositions of whoever has the floor.

If programmers find it convenient to simply drop a user into a confusing file system of nested, hierarchical folders to find the information she needs, they define the elastic user as an accommodating, computer-literate power user. Other times, when they find it more convenient to step the user through a difficult process with a wizard, they define the elastic user as an unsophisticated first-time user. Designing for the elastic user gives the developer license to code as he pleases while still apparently serving "the user." However, our goal is to design *software* that properly meets *real* user needs. Real users — and the personas representing them — are not elastic, but rather have specific requirements based on their goals, capabilities, and contexts.

SELF-REFERENTIAL DESIGN

Self-referential design occurs when designers or developers project their own goals, motivations, skills, and mental models onto a product's design. Most "cool" product designs fall into this category: The audience doesn't extend beyond people like the designer, which is fine for a narrow range of products and completely inappropriate for most others. Similarly, programmers apply self-referential design when they create implementation-model products. *They* understand perfectly how it works and are comfortable with such products. Few non-programmers would concur.

DESIGN EDGE CASES

Another syndrome that personas help prevent is designing for edge cases — those situations that might possibly happen, but usually won't for the target personas. Naturally, edge cases must be 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.

Personas are based on research

Personas must, like any model, be based on real-world observation. As discussed in the preceding chapter, the primary source of data used to synthesize personas must be from ethnographic interviews, contextual inquiry, or other similar dialogues with and observation of actual and potential users. The quality of the data gathered following the process (outlined in Chapter 4) directly impacts the efficacy of personas in clarifying and directing the synthesis of design solutions. Other data that can support and supplement the creation of personas include, in rough order of efficacy:

- ✓ Interviews with users outside of their use contexts
- ✓ Information about users supplied by stakeholders and subject matter experts (SMEs)
- ✓ Market research data such as focus groups and surveys
- ✓ Market segmentation models
- ✓ Data gathered from literature reviews and previous studies

However, none of this supplemental data can take the place of direct interaction with and observation of users in their native environments. Almost every word in a well-developed persona's description can be traced back to user quotes or observed behaviors.

Personas are represented as individuals

Personas are user models that are represented as specific, individual humans. They are not actual people, but are synthesized directly from observations of real people. One of the key elements that allow personas to be successful as user models is that they are *personifications* (Constantine and Lockwood, 2002). They are *represented* as specific individuals. This is appropriate and effective because of the unique aspects of personas as user models: They engage the *empathy* of the development team towards the human target of the design. Empathy is critical for the designers, who will be making their decisions for design frameworks and details based on both the cognitive *and* emotional dimensions of the persona, as typified by the persona's goals. (We will discuss the important connections between goals, behaviors, and personas later in this chapter.) However, the power of empathy should not be quickly discounted for other team members. The authors have observed that personas not only make the decision process for incorporating specific design elements easier from a design standpoint, but more compelling from a stakeholder-adoption standpoint. When personas have been carefully and appropriately crafted, stakeholders and programmers begin to think about them as if they are real users.

Grudin and Pruitt (2002) have noted the power of fictional characters in television programs (the authors would draw a comparison to an earlier form, the novel) to engage viewers. They note, as well, the power of **method acting** as a tool that actors use to understand and portray realistic characters. In fact, as we shall see in Chapter 6, the process of creating personas from user observation and later role-playing scenarios from the perspective of these personas is in many ways analogous to method acting. One designer has described the authors' Goal-Directed use of personas as the Stanislavsky Method of interaction design.

Personas represent classes of users in context

Although personas are represented as specific individuals, at the same time they represent a class or type of user of a *particular* interactive product. Specifically, a persona encapsulates a distinct set of **usage patterns**, behavior patterns regarding the use of a particular product (or analogous activities in the domain if a product does not yet exist). These patterns are identified through an analysis of ethnographic interviews, supported by supplemental data if necessary or appropriate. These patterns, along with work- or lifestyle-related roles define personas as user archetypes (Mikkelson N. and Lee, W. O., 2000). The authors refer to personas as **composite user archetypes** because personas are in a sense composites assembled by clustering related usage patterns observed across individuals in similar roles during the Research phase.

PERSONAS AND REUSE

Organizations with more than one product often want to reuse the same personas. However, to be effective, personas must be context-specific — they should be focused on the behaviors and goals related to the specific domain of a particular product. Personas, because they are constructed from specific observations of users interacting with specific products in specific contexts, cannot easily be reused across products (Grudin and Pruitt, 2002) even when those products form a closely linked suite. Even then, the focus of behaviors may be quite different in one product than

in another, so researchers must take care to perform supplemental user research. The authors believe that, in most cases, personas should be researched and developed individually for different products.

ARCHETYPES VERSUS STEREOTYPES

Don't confuse persona archetypes with stereotypes. Stereotypes are, in most respects, the antithesis of well-developed personas. Stereotypes represent designer or researcher biases and assumptions, rather than factual data. Personas developed drawing on inadequate research (or synthesized with insufficient empathy and sensitivity to interview subjects) run the risk of degrading to stereotypical caricatures. Personas must be developed and treated with dignity and respect for the people whom they represent. If the designer doesn't respect his personas, nobody else will either. Personas also bring to the forefront issues of social and political consciousness (Grudin and Pruitt, 2002). Because personas provide a precise design target and also serve as a communication tool to the development team, the designer much choose particular demographic characteristics with care. Ideally, persona demographics should be a composite reflection of what researchers have observed in the interview population, modulated by broad market research. Personas should be *typical* and believable, but not stereotypical. If the data is not conclusive or the characteristic is not important to the design or its acceptance, the authors prefer to err on the side of gender, ethnic, age, and geographic diversity.

Personas explore ranges of behavior

The target market for a product describes demographics as well as lifestyles and sometimes job roles. What it does not describe are the ranges of different behaviors that members of that target market exhibit regarding the product itself and product-related contexts. Ranges are distinct from *averages*: Personas do not seek to establish an average user, but rather to identify *exemplary types* of behaviors along identified ranges.

Personas fill the need to understand how users behave within a given product domain — how they think about it and what they do with it — as well as how they behave in other contexts that may affect the scope and definition of the product. Because personas must describe *ranges* of behavior to capture the various possible ways people behave with the product, designers must identify a collection or cast of personas associated with any given product. Multiple personas carve up continuous ranges of behavior into discrete clusters. Different personas represent different correlated groups of behaviors. These correlations should become evident upon examination of the research and should be logically connected. The process of clustering behaviors is discussed in greater detail later in this chapter.

Personas must have motivations

All humans have motivations that drive their behaviors; some are obvious, and many are subtle. It is critical that personas capture these motivations in the form of goals. The goals we enumerate for our personas (which we will discuss at length later in this chapter) are shorthand notation for motivations that not only point at specific usage patterns, but also provide a reason why those behaviors exist. Understanding *why* a user performs certain tasks gives designers great power to improve or even eliminate those tasks, yet still accomplish the same goals.

Personas versus user roles

User roles and user profiles each share similarities with personas; that is, they both seek to describe relationships of users to products. But personas and the methods by which they are employed as a design tool differ significantly from roles and profiles in several key aspects.

User roles or role models, as defined by Larry Constantine (1999), are an *abstraction*, a defined relationship between a class of users and their problems, including needs, interests, expectations, and patterns of behavior. Holtzblatt and Beyer's (1998) use of roles in consolidated flow, cultural, physical, and sequence models is similar in that it attempts to isolate various relationships abstracted from the people possessing these relationships.

It is the authors' argument that these methods can be problematic for these reasons:

✓ It is more difficult to properly identify relationships in the abstract, isolated from people who possess them — the human power of empathy cannot easily be brought to bear on abstract classes of people.

✓ Both methods focus on *tasks* almost exclusively and neglect the use of goals as an organizing principle for design thinking and synthesis.

✓ Holzblatt and Beyer's consolidated models, although useful and encyclopedic in scope, are difficult to bring together as a coherent tool for developing, communicating, and measuring design decisions.

Personas address each of these problems. Well-developed personas incorporate the same type of relationships as user roles do, but express them in terms of goals and examples in narrative. This makes it easier for both designers and stakeholders to understand the implications of design decisions in more human terms. Personas also use goals to provide contexts to and structure for tasks, incorporating cultural and workflow information and translating it into behavioral drivers.

In general, personas provide a more holistic model of users and their contexts, where many other models seek to be more reductive. In any case, personas can certainly be used in combination with these other modeling techniques; and as we'll discuss at the end of the chapter, some models make extremely useful complements to personas.

Personas versus user profiles

Many usability practitioners use the terms persona and user profile synonymously. There is no problem with this if the profile is truly generated from ethnographic data and encapsulates the depth of information the authors have described. Unfortunately, all too often, the authors have seen user profiles that reflect Webster's definition of profile as a "brief biographical sketch." In other words, user profiles are often a name (and possibly a picture) attached to brief, usually demographic data, along with a short, *fictional* paragraph describing the kind of car this person drives, how many kids he has, where he lives, and what he does for a living. This kind of user profile is likely to be a user stereotype and is not useful as a design tool. Although we give our personas names, and sometimes even cars and family members, these are employed sparingly as narrative tools to help better communicate the real data and are not ends in themselves. Supporting fictional detail plays only the most minor part in persona creation and is used just enough to make the persona come to life in the minds of the designers and the product team.

Personas versus market segments

Marketing professionals may be familiar with a process similar to persona development because it shares some process similarities with market definition. The main difference between market segments and design personas is that the former are based on demographics and distribution channels, whereas the latter are based on user behaviors and goals. The two are not the same and don't serve the same purpose. The marketing personas shed light on the sales process, whereas the design personas shed light on the development process. This said, market segments play a role in persona development: They can help determine the demographic range within which to frame the persona hypothesis (see Chapter 4). Personas are segmented along ranges of behavior, not demographics or attitudes, so there is seldom a one-to-one mapping of market segments to personas. Rather, market segments can act as an initial filter to limit the scope of interviews to people within target markets (see Figure 5-3).

User personas versus non-user personas

A frequent product definition error is to target people who review, purchase, or administer the product, but who are not end users. Many products are designed for columnists who review the product in consumer publications. IT managers who purchase enterprise products are, typically, not the users of the products. Designing for the purchaser is a frequent mistake in the development of digital products.

Although you cannot ignore the IT managers' needs, they will ultimately be better served if the product serves the *real* end user well. If the end user is satisfied and productive, the IT managers are successful as well.
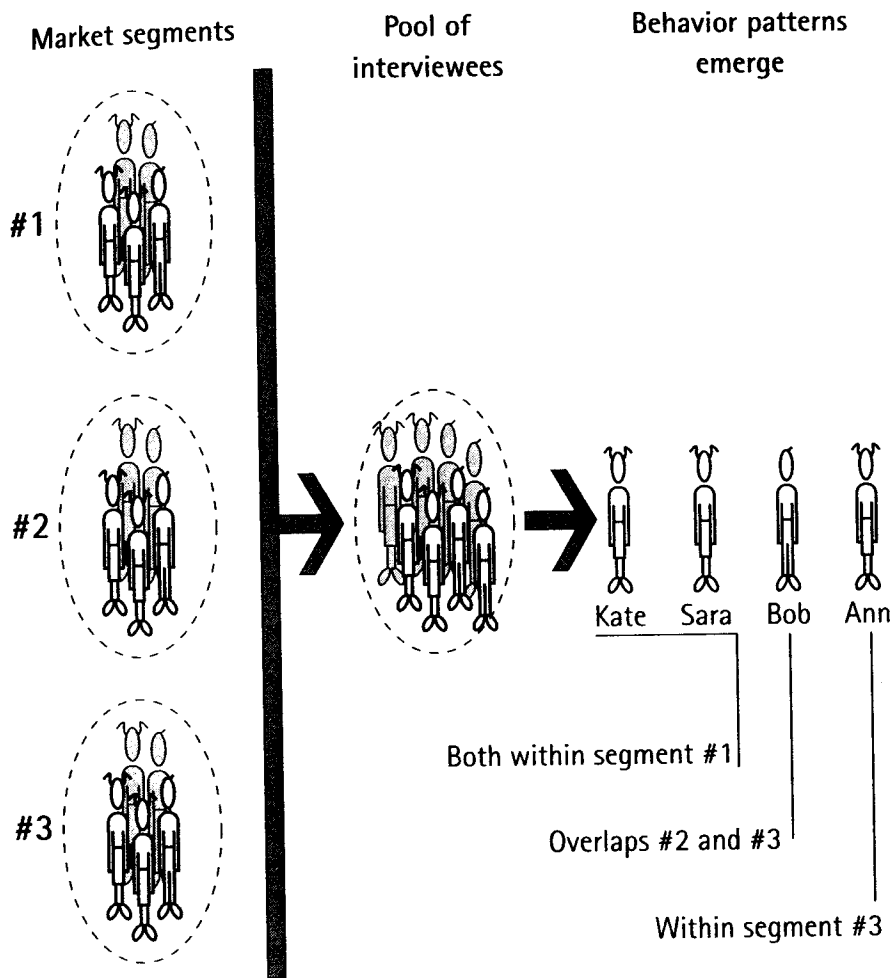
In certain cases, such as for enterprise systems that require maintenance and administrator interfaces, it is appropriate to create non-user personas. This requires that research be expanded to include these types of people. These personas may have their own, separate interfaces, or they may simply be useful from a rhetorical standpoint to delineate what the product should and shouldn't do. Non-user personas also often provide additional business goals that must be balanced with the user goals embodied by the user personas.

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 remains useless as a design tool. User goals serve as a lens through which designers must consider the functions of a product. The function and behavior of the product must address goals via tasks — typically, as few tasks as absolutely necessary. Remember, tasks are only a means to an end; goals are the end themselves.

Goals motivate usage patterns

People's or personas' goals motivate them to behave the way they do. Thus, goals provide not only an answer to why and how personas desire to use a product, but can also serve as a shorthand in the designer's mind for the sometimes complex behaviors in which a persona engages and, therefore, for the tasks as well.

Market segments   Pool of   Behavior patterns
                       interviewees   emerge

#1

#2

#3

Kate   Sara   Bob   Ann

Both within segment #1

Overlaps #2 and #3

Within segment #3

Figure 5-3: Personas versus market segments. Market segments can be used in the Research phase to limit the range of personas to target markets. However, there is seldom a one-to-one mapping between market segments and personas.

Goals must be inferred from qualitative data

You can't ask a person what his goals are directly: Either he won't be able to articulate them, or he won't be accurate or even perfectly honest. People simply aren't well prepared to answer such questions accurately. Therefore, designers and researchers need to carefully reconstruct goals from observed behaviors, answers to other questions, non-verbal cues, and clues from the environment such as book titles on shelves. One of the most critical tasks in the modeling of personas is identifying goals and expressing them succinctly: Each goal should be expressed as a simple sentence.

Types of goals

Goals come in many different varieties. The most important goals from a user-centered design standpoint are the goals of users. These are, generally, first priority in a design, especially in the design of consumer products. Non-user goals can also come into play, especially in enterprise environments. The goals of organizations, employers, customers, and partners all need to be acknowledged, if not addressed directly, by the product's design.

USER GOALS

User personas have user goals. These range from broad aspirations to highly pragmatic product expectations. User goals fall into three basic categories (Goodwin, 2001):

✓ Life goals

✓ Experience goals

✓ End goals

We describe each of these in detail in the following sections.

LIFE GOALS   Life goals represent personal aspirations of the user that typically go beyond the context of the product being designed. These goals represent deep drives and motivations that help explain *why* the user is trying to accomplish the end goals he seeks to accomplish. These can be useful in understanding the broader context of relationships the user may have with others and her expectations of the product from a brand perspective.

✓ Be the best at what I do

✓ Get onto the fast track and win that big promotion

✓ Learn all there is to know about this field

✓ Be a paragon of ethics, modesty, and trust

Life goals rarely figure directly into the design of specific elements of an interface. However, they are very much worth keeping in mind. A product that the user discovers will take him closer to his life goals, and not just his end goals, will win him over more decisively than any marketing campaign. Addressing life goals of users makes the difference (assuming other goals are also met) between a satisfied user and a fanatically loyal 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.

✓ Don't feel stupid

✓ Don't make mistakes

✓ Feel competent and confident

✓ Have fun (or at least not be too bored)

Experience goals represent the unconscious goals that people bring to any software product. They bring these goals to the context without consciously realizing it and without necessarily even being able to articulate the goals. People have an unconscious desire to be treated with decency and dignity and to be supported, not chastised. When software makes users feel stupid, their self-esteem drops and their effectiveness plummets, regardless of their other goals. Their

level of discomfort and resentment also increases. Enough of this type of treatment and users will be primed to use any chance to subvert the system. Any system that violates personal goals will ultimately fail, regardless of how well it purports to achieve other goals.

END GOALS End goals represent the user's expectation of the tangible outcomes of using a specific product. When you pick up a cell phone, you likely have an outcome in mind. Similarly, when you search the Web for a particular item or piece of information, you have some clear end goals. When you open a document with a word processor, you have something in mind that you expect to accomplish. End goals must be met for users to think that a product is worth their time and money; most of the goals a product needs to concern itself with are, therefore, end goals such as the following:

✓ Find the best price

✓ Finalize the press release

✓ Process the customer's order

✓ Create a numerical model of the business

COMBINING END GOALS AND EXPERIENCE GOALS End goals have more appeal than experience or life goals, especially to sober businesspeople and programmers. True to their nature, they create software that — although it admirably fulfills the end goals — fails utterly to satisfy the experience goals of the user. Even if end goals are recognized and satisfied, users feel poorly about themselves and the product if experience goals are not also met. Sure, they get their work accomplished, but it's not a pleasant or empowering experience. On the other hand, if your software ignores the practical and serves *only* the user's experience goals, you have designed a toy, not a business application.

NON-USER GOALS

Customer goals, corporate goals, and technical goals are all non-user goals. Typically, these goals must be acknowledged and considered, but they do not form the basis for the design direction. Although these goals need to be addressed, they must not be addressed at the expense of the user.

CUSTOMER GOALS Customers, as already discussed, have different goals than users. The exact nature of these goals varies quite a bit between consumer and enterprise products. Consumer customers are often parents, relatives, or friends who often have concerns about the safety and happiness of the persons for whom they are purchasing the product. Enterprise customers are typically IT managers, and they often have concerns about security, ease of maintenance, and ease of customization. Customer personas also may have their own life, experience, and especially end goals in relation to the product if they use it in any capacity. Customer goals should never trump end goals, but need to be considered within the overall design.

CORPORATE GOALS Businesses and other organizations have their own requirements for software, and they are as high level as the personal goals of the individual. "To increase our profit" is pretty fundamental to the board of directors or the stockholders. The designer uses these goals to

stay focused on the bigger issues and to avoid getting distracted by tasks or other false goals. Corporate goals include the following:

- ✓ Increase profit
- ✓ Increase market share
- ✓ Defeat the competition
- ✓ Use resources more efficiently
- ✓ Offer more products or services

Psychologists who study the workplace have a term, hygienic factors, which Saul Gellerman (1963) defines as "prerequisites for effective motivation but powerless to motivate by themselves." The lights in your office, for example, are hygienic. You don't go to work because the lights are nice; but if there were no lights at all, you wouldn't bother showing up.

Corporate goals are hygienic factors in this sense. From the corporation's point of view, it has important goals. But the corporation isn't doing the work; its people are, and their more personal life, experience, and end goals are equally decisive.

Corporate goals can't be slighted, however. Software that fails to achieve them will fail just as readily as software that fails to meet user goals.

TECHNICAL GOALS   Most of the software-based products we use everyday are created with technical goals in mind. Many of these goals ease the task of software creation, which is a programmer's goal. This is why they take precedence at the expense of the users' goals.

- ✓ Save memory
- ✓ Run in a browser
- ✓ Safeguard data integrity
- ✓ Increase program execution efficiency
- ✓ Use "cool" technology or features
- ✓ Maintain consistency across platforms

Technical goals in particular are very important to the development staff. It is important to stress early in the education process that these goals need to serve user and business goals. Technical goals should derive from the need to meet other more human-oriented goals. It might be a software company's *task* to use new technology, but it is never a *user's goal* to do so. As users, we don't care if we get our job done with hierarchical databases, relational databases, object-oriented databases, flat-file systems, or black magic. What we care about is getting our job done swiftly with a modicum of ease and dignity.

Successful products meet user goals first

Designing a *good* interactive product has meaning only for a person using an artifact for some purpose in some context. You cannot have purposes without people. The two are inseparable. That

is why a key tool in the process of designing behavior is personas: specific people working towards specific purposes or goals.

The most important purposes or goals to consider are those of the individuals making actual use of the artifact or application, not necessarily those of its purchaser. A real person interacts with your product, not a corporation or even an IT manager, so you must regard his personal goals as more significant than those of the corporation who employs him or the IT manager who supports him. Your users will do their best to achieve their employer's business goals, while at the same time looking after their own personal goals. A user's most important goal is always to retain his human dignity: not to feel stupid.

We can reliably say that we make the user feel stupid if we let him make big mistakes, keep him from getting an adequate amount of work done, or bore him.

AXIOM

Don't make the user feel stupid.

This is probably the most important interaction design guideline. In the course of this book, we examine numerous ways in which existing software makes the user feel stupid, and we explore ways to avoid that trap.

The essence of good interaction design is devising interactions that achieve the goals of the manufacturer or service provider and their partners without violating the goals of users.

Constructing Personas

As previously discussed, personas are derived from patterns observed during interviews with and observations of users and potential users (and sometimes customers) of a product. Gaps in this data are filled by supplemental research and data provided by SMEs, stakeholders, and available literature. In constructing a set of personas, we are looking to segment use across a set of observed behavioral variables (also called axes or ranges). Well-developed personas incorporate information about goals, attitudes, work or activity flow, environment, skills and skill levels, and frustrations.

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 process described in this section, developed by Robert Reimann, Kim Goodwin, and Lane Halley, is the result of an evolution in practice over the span of dozens of interaction design projects.

1. Revisit the persona hypothesis.

2. Map interview subjects to behavioral variables.

3. Identify significant behavior patterns.

4. Synthesize characteristics and relevant goals.

5. Check for completeness.

6. Develop narratives.

7. Designate persona types.

We will discuss each of these steps in detail in the following sections.

Revisit the persona hypothesis

After you have completed your research and performed a cursory organization of the data, you next compare patterns identified in the data to the assumptions made in the persona hypothesis. Were the possible roles that you identified truly distinct? Were the behavioral variables (see Chapter 4) you identified valid? Were there additional, unanticipated ones, or ones you anticipated that weren't supported by data?

List the complete set of behavioral variables observed. Demographic variables such as age or technical skill may also seem to affect behavior, but be wary of focusing on demographics during persona creation because behavioral variables have far more impact on the design. For enterprise applications, behavioral (and demographic) variables are often closely associated with job roles. Although the number of variables will differ from project to project, it is typical to find 15 to 30 variables per role.

If your data is at variance with your assumptions, you need to add, subtract, or modify the roles and behaviors you anticipated. If the variance is significant enough, you may consider additional interviews to cover any gaps in the new behavioral ranges that you've discovered.

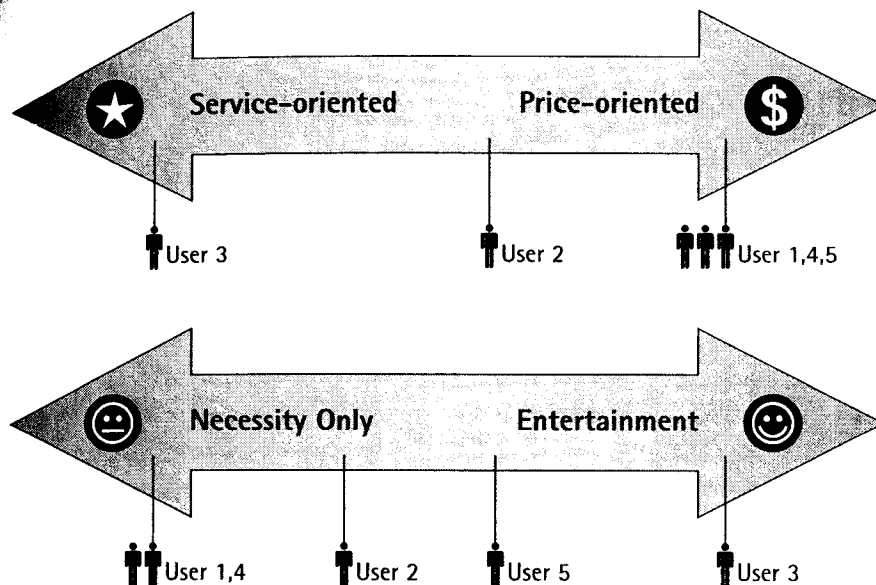## Map interview subjects to behavioral variables

After you are satisfied that you have identified the entire set of behavioral variables exhibited by your interview subjects, the next step is to map each interviewee against each variable range that applies. The precision of this mapping isn't as critical as identifying the placement of interviewees in relationship to each other. In other words, it doesn't matter if an interviewee falls at precisely 45% or 50% on the scale (there's often no good way to measure this precisely; you must rely on your gut feel based on your observations of the subject). It is the way multiple subjects cluster on each variable axis that is significant (see Figure 5-4).

Identify significant behavior patterns

After you have mapped your interview subjects, you see clusters of particular subjects that occur across multiple ranges or variables. A set of subjects who cluster in six to eight different variables will likely represent a significant behavior pattern that will form the basis of a persona (Goodwin, 2002). Some specialized roles may exhibit only one significant pattern, but typically you will find two or even three such patterns.

For a pattern to be valid, there must be a logical or causative connection between the clustered behaviors (Goodwin, 2002), not just a spurious correlation. For example, there is clearly a logical connection if data shows that people who regularly purchase CDs also like to download MP3 files, but there is probably no logical connection if the data shows that interviewees who frequently purchase CDs also seem to enjoy stamp collecting.

Figure 5-4: Mapping interview subjects to behavioral variables. This example is from e-commerce. Interview subjects are mapped across each behavioral axis. Precision of the absolute position of an individual subject on an axis is less important than its relative position to other subjects. Clusters of subjects across multiple axes indicate significant behavior patterns.

Synthesize characteristics and relevant goals

For each significant behavior pattern you identify, you must synthesize details from your data. Describe the potential use environment, typical workday (or other relevant time period), current solutions and frustrations, and relevant relationships with others (Goodwin, 2002a).

Brief bullet points describing characteristics of the behavior are sufficient. Stick to observed behaviors as much as possible; a description or two that sharpen the personalities of your personas can help bring them to life. Too much fictional, idiosyncratic biography, however, is a distraction and makes your personas less credible (Goodwin, 2002a). Remember that you are creating a design tool, not a character sketch for a novel. Only concrete data can support the design and business decisions your team will ultimately make.

One fictional detail at this stage *is* important: the personas' first and last names. The name should be evocative of the type of person the persona is, without tending toward caricature or stereotype. The authors use a baby name book as a reference tool in creating persona names. You can also, at this time, add in some demographic information such as age, geographic location, relative income (if appropriate), and job title. This information is primarily to help you visualize the persona better as you assemble the behavioral details. From this point on, you should refer to the persona by his or her name.

PERSONA INTERRELATIONSHIPS

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. The typical case, however, is for individual personas to be completely unrelated to each other and often from completely different geographic locations and social groups.

It makes sense for personas to have social relationships between each other only if:

1. You did not observe any behavioral variations in your interview subjects related to variations in company size, industry, or family/social dynamic.

2. Doing so is critical to illustrate workflow or social interactions between co-workers or members of a family or social group.

If you create personas that work for the same company or have social relationships with each other, you might run into difficulties if you need to express a significant goal that doesn't belong with the pre-established relationship. While a single social relationship between your set of personas is easier to define than several different, unrelated social relationships between individual personas and minor players outside the persona set, it's much better to put the initial effort into development of diverse personas than it is to risk the temptation of bending more diverse scenarios to fit a single social dynamic.

SYNTHESIZING GOALS

Goals are the most critical detail to synthesize from your interviews and observations of behaviors. Goals are best derived from an analysis of the group of behaviors comprising each persona. By identifying the logical connections between each persona's behaviors, you can begin to infer the goals that lead to those behaviors. You can infer goals both by observing actions (what interview subjects in each persona cluster are trying to accomplish and why) and by analyzing subject responses to goal-oriented interview questions (see Chapter 4).

To be effective as design tools, goals must always directly relate, in some way, to the product being designed. Typically, the majority of useful goals for a persona are *end goals*. You can expect most personas to have three to five end goals associated with them. Life goals are most useful for personas of consumer-oriented products, but they can also make sense for enterprise personas in transient job roles. Zero or one life goal is appropriate for most personas. General experience goals such as "don't feel stupid" and "don't waste time" can be taken as implicit for almost any persona. Occasionally, a specific domain may dictate the need for more specific experience goals; zero to two experience goals is appropriate for most personas.

Check for completeness and distinctiveness

At this point, your personas should be starting to come to life. You should check your mappings and personas' characteristics and goals to see if there are any important gaps that need filling. This again may point to the need to perform additional research directed at finding particular behaviors missing from your behavioral axes. You might also want to check your notes to see if there are any political personas that you need to add to satisfy stakeholder assumptions or requests.

If you find that two personas seem to vary only by demographics, you may choose to eliminate one of the redundant personas or tweak the characteristics of your personas to make them more distinct. Each persona must vary from all others in at least one significant behavior. If you've done a good job of mapping, this shouldn't be an issue.

By making sure that your persona set is both distinct and complete, you will be able to maintain a manageable set of personas.

Develop narratives

Your list of bullet point characteristics and goals point to the essence of complex behaviors, but leaves much implied. Third-person narrative is far more powerful in conveying the persona's attitudes, needs, and problems to other team members. It also deepens the designer/authors' connection to the personas and their motivations.

A typical persona narrative should be no longer than one or two pages of prose. The persona narrative does not need to contain every observed detail because, ideally, the designers also performed the research, and most people outside the design team do not require more detail than this.

The narrative must, by nature, contain some fictional events and reactions, but as previously discussed, it is not a short story. The best narrative quickly introduces the persona in terms of his job or lifestyle (enterprise versus consumer), and briefly sketches a day in his life, 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. The narrative should express what the persona is looking for in the product by way of a conclusion.

Be careful about precision of detail in your descriptions. The detail should not exceed the depth of your research. In scientific disciplines, if you record a measurement of 35.421 m, this implies that your measurements are accurate to .001 m. Likewise a detailed persona description implies a similar level of observation in your research (Goodwin, 2002a).

When you start developing your narrative, choose photographs of your personas. Photographs make them feel more real as you create the narrative and engage others on the team when you are finished. You should take great care in choosing a photograph. The best photos capture demographic information, hint at the environment (a persona for a nurse should be wearing a nurse's uniform and be in a clinical setting, perhaps with a patient), and capture the persona's general attitude (a photo for a clerk overwhelmed by paperwork might look harried). The authors keep several searchable databanks of stock photography available for finding the right persona pictures.

Designate persona types

By now your personas should feel very much like a set of real people that you feel you know. The final step in persona construction finishes the process of turning your qualitative research into a powerful set of design tools.

All design requires a design target — the audience upon whom the design is focused. The personas, which we have created, represent the possible *candidates* for that design target. A single interface can only be designed for a single persona.

AXIOM

Design each interface for a single, primary persona.

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 from the set whose needs and goals can be completely and happily satisfied by a single interface without disenfranchising any of the other

personas. We accomplish this through a process of designating persona types. There are six types of persona, and they are typically designated in roughly the order listed here:

✓ Primary

✓ Secondary

✓ Supplemental

✓ Customer

✓ Served

✓ Negative

We discuss each of these persona types and their significance from a design perspective in the following sections.

PRIMARY PERSONAS

Primary personas represent the primary target for the design of an interface. There can be only one primary persona per interface for a product, but it is possible for some products (especially enterprise products) to have multiple distinct interfaces, each targeted at a distinct primary persona (for example, a healthcare information system might have separate clinical and financial interfaces, each targeted at a different persona).

A primary persona is not satisfied by a design targeted at any other persona in the set. However, if the primary persona is the target, all other personas are at least minimally satisfied (and thus not unhappy).

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, each with a suitable primary (often the case for enterprise and technical products), or the product is trying to accomplish too much. If your consumer product has multiple primary personas, the scope of the product may be too broad.

SECONDARY PERSONAS

Sometimes a situation arises in which a persona would be entirely satisfied by a primary persona's interface if one or two specific additional needs (not required by the primary) were addressed by the interface. This indicates that the persona in question is a secondary persona for that interface, and the design of that interface must address those needs without getting in the way of the primary persona. Typically, an interface will have zero to two secondary personas. More than that again indicates scope problems with the product.

SUPPLEMENTAL PERSONAS

User personas that are not primary or secondary are supplemental personas: They are completely satisfied by one of the primary interfaces. There can be any number of supplemental personas associated with an interface. Often political personas—the ones added to the cast to address stakeholder assumptions—become supplemental personas.

CUSTOMER PERSONAS

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

SERVED PERSONAS

Served personas are somewhat different from the persona types already discussed. 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 very much *served* by a good interface. Served personas provide a way to track second-order social and physical ramifications of products. These are treated like secondary personas.

NEGATIVE PERSONAS

Like served personas, negative personas aren't users of the product. Unlike served personas, their use is purely rhetorical, to help communicate to other members of the team who should definitely *not* be the design target for the product. Good candidates for negative personas are often technology-savvy early-adopter personas for consumer products and IT specialists for end-user enterprise products.

Other Models

Personas are extremely useful tools, but they are certainly not the only tool to help model users and their environment. Holzblatt and Beyer's *Contextual Design* provides a wealth of information on the models briefly discussed here. Workflow or sequence models are useful for capturing information flow and decision-making processes inside organizations and are usually expressed as directed graphs that capture several phenomena:

- ✓ What initiates a process
- ✓ Information the user produces and consumes
- ✓ Decisions the user makes
- ✓ Actions the user takes
- ✓ Results that follow from actions

A well-developed persona should capture personal workflows, but workflow models are still necessary for capturing interpersonal and organizational workflows.

Artifact models represent, as the name suggests, different artifacts that users employ in their tasks and workflows. Often these artifacts are online or paper forms. Artifact models typically capture commonalities and significant differences between similar artifacts for the purpose of extracting and replicating best practices in the eventual design. Artifact models can be useful later in the design process, with the caveat that direct translation of paper systems to digital systems, without a careful analysis of goals and application of design principles (especially those found in Section Two of this book), usually leads to usability issues.

Physical models, like artifact models, endeavor to capture elements of the user's environment. Physical models focus on capturing the layout of physical objects that comprise the user's workspace, which can provide insight into frequency of use issues and physical barriers to productivity. Good persona descriptions will incorporate some of this information, but it may be helpful in complex physical environments (such as shop floors and assembly lines) to create discrete, detailed physical models (maps) of the user environment.

Personas and other models make sense out of otherwise overwhelming and confusing user data. Now that you are empowered with sophisticated models as design tools, the next chapter will show you how to employ these tools to translate user goals and needs into workable design solutions.