

April 12, 2011

# Mobile App Design Best Practices

by Mike Gualtieri

for Application Development & Delivery Professionals



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## Mobile App Design Best Practices

When It Comes To Designing The Mobile User Experience (UX), Context Is King

by **Mike Galtieri**

with Mike Gilpin, Jeffrey S. Hammond, and Adam Knoll

### EXECUTIVE SUMMARY

Mobile applications continue to proliferate. But the quality of mobile user experiences ranges from pathetic to pure joy. You can develop an app for the iconic Apple iPhone that has horrible usability. Likewise, you can develop an app for Windows Phone 7 that seems to read your mind. If you think mobile user experience design is about choosing the best development tools and designing for a smaller screen size, guess again. Sure, the platform is important, but great mobile user experiences don't happen just because you chose the best development tools. To deliver apps your users will love, you must design a user experience that is useful, usable, and desirable and that takes into account the five dimensions of the mobile context: location, locomotion, immediacy, intimacy, and device. User experience design is the differentiator. Great mobile apps are the result. This report shows you how.

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### NOTES & RESOURCES

Forrester built on its existing research in user experience design best practices and interviewed leading experts in mobile smartphone and tablet application design. In addition, we reviewed relevant third-party research, books, and articles on mobile devices and user experience design.

#### Related Research Documents

["Mobile App Internet Recasts The Software And Services Landscape"](#)

February 28, 2011

["The Seven Qualities Of Wildly Desirable Software"](#)

January 24, 2011

["Mobile Development Goes Multiplatform"](#)

December 22, 2010

## YOU MUST GET THE MOBILE USER EXPERIENCE RIGHT

Mobile apps are now de rigueur.<sup>1</sup> If you haven't developed one yet, then you probably will soon.<sup>2</sup> If you have already developed one, then you probably need to make it better. Your app is the movie. The users are the audience. How many stars you get depends on the mobile user experience you design (or don't design) and the audience's reaction to it. Voting begins as soon as you release your app. And vote they will, whether with reviews on social media sites or with their thumb or forefinger when they adopt your mobile app. Unfortunately, too few application development teams appreciate the value of mobile user experience design. Many application development teams:

- **Mistakenly think that choosing the right mobile development platform is what matters most.** Many application development professionals obsess over what tools and technology they should choose to develop a mobile app. Sure, making the right choice among the many options, such as HTML/JavaScript, native application, and mobile middleware, is important.<sup>3</sup> But it is less than half the battle. If users don't love your application, then they will simply move on to another application that they do love — or use no app at all.
- **Wrongly focus only on designing for a smaller screen size, ignoring other key design factors.** Yes, there are many form factors, and screens sizes do tend to be smaller. But savvy designers recognize that mobile is about much more than a smaller screen size. Mobile means you can take it with you and use it anywhere, anytime. Screen sizes vary among smartphones, eReaders, and tablets. What's next? A tiny mobile device that can project a four-foot screen on the wall and respond to hand gestures? There goes the screen size theory! Certainly screen size is an important factor in mobile user experience design — but it is only one factor.

If this is your view of mobile experience design, don't worry. Read on to learn what truly matters in mobile user experience design: the best practices for designing mobile apps that will lead your customers to say, "This app is awesome."

## Serve Mobile Business Goals By Serving Mobile User Goals

Forrester defines mobile applications as:

*Software on a mobile device such as a smartphone, tablet, eReader, or any other device that users can easily take with them and use anywhere, anytime.*

Remember, mobile users are your customers or employees. Business stakeholders define the business goals, but mobile user experience design is about your app's actual users. In fact, some business stakeholders may have goals that are in opposition to your users' goals. For example, a marketing professional might want to add a requirement to collect information for marketing purposes, annoying users with additional questions that benefit marketing but slow down the user. Your app's mobile user experience exists in the broader context of your business objectives;

well-designed mobile apps help mobile users do something that furthers the organization's goals. For example, Liberty Mutual Insurance offers customers an Apple iPhone app that streamlines automobile accident claim processing by enabling (see Figure 1):

- **Customers to make a claim when the details are fresh in their minds.** The app serves users' goals by making it easy to file a claim during a stressful situation. The app walks customers through the process of mapping the location of the accident using GPS, taking pictures of the damage using the iPhone camera, collecting contact information from the other driver, and recording voice notes to help remember key details at the time of the accident.
- **The insurance company to process claims faster.** The app serves business goals because it enables the insurance company to collect more-accurate accident information, start processing the claim faster with greater confidence, and make the customer's interaction more pleasant despite a difficult situation.

**Figure 1** Liberty Mutual Insurance's Apple iPhone App Streamlines Claim Processing For All



Source: Liberty Mutual Insurance Apple iPhone app

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Source: Forrester Research, Inc.

### Successful Mobile Applications Must Be Loved

The opposite of love is not hate; it's indifference. In a world where there are already hundreds of thousands of mobile apps to choose from, indifference is failure.<sup>4</sup> Lisa, a Droid mobile smartphone user, expressed a common sentiment: "I feel like everyone wants me to download their app, but no one is showing me how it will significantly improve my life."<sup>5</sup> You must design apps that your target users love. So:

- **What's to love about an auto accident insurance claims mobile app?** Perhaps nothing, until you are in a fender bender.
- **What's to love about a bar code scanning app?** Perhaps nothing, until you save \$147.99.
- **What's to love about a home security app?** Perhaps nothing, until you remember that you forgot to set your alarm after you already arrived in Cavtat, Croatia, for a seven-day vacation on the Adriatic.

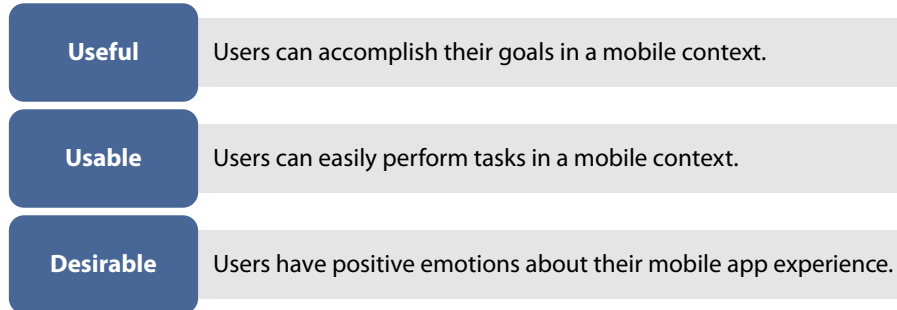
To make your app lovable, you must design a compelling mobile app user experience. Forrester defines mobile app user experience as:

*Users' perception of the usefulness, usability, and desirability of a mobile application based on the sum of all their direct and indirect interactions with it.*

Lovable mobile user experiences must be (see Figure 2):

- **Useful: Can users achieve their goals?** First and foremost, a mobile app must provide functionality that allows a user to fulfill his goals. A mobile user on the go might urgently need an app to remind her of her travel itinerary. An exhausted mobile user in a train station might just want to be entertained with a game or video. Mobile devices are a channel through which you can deliver useful functions to customers, employees, or business partners based on your ingenuity, the capabilities of your business, and the design and quality of your app.
- **Usable: How easily can they achieve their goals?** What good is great functionality if it is hard to use? Your mobile app must also be easy to use. You may provide some new, supremely useful functionality to mobile users. They will use it because usefulness trumps poor usability. But if a competitor's app offers the same usefulness but is easier to use, then, all other things being equal, users will go with the more usable app.
- **Desirable: Does the experience engender positive emotions?** You'd think that useful and usable would be enough — but they are not. Users also want to enjoy their experience, and the many other apps on their device increasingly condition them to expect enjoyable app experiences. Users respond to positive emotional connections to the product. Just ask any Apple iPhone user. Users ultimately judge a mobile device's desirability based on the desirability of the mobile app experiences it provides. And just as you can design a mobile app to be useful and usable, you can design it to be desirable.

**Figure 2** Compelling Mobile User Experiences Must Be Useful, Usable, And Desirable



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Source: Forrester Research, Inc.

## MOBILE CONTEXT IS KING WHEN IT COMES TO MOBILE APP DESIGN

Mobile is special because of its anywhere, anytime nature. Mobile device users can find themselves in just about any imaginable location and situation. If they can be there, then their mobile device can help them with both expected and unexpected situations and can be critical to their job. Users take mobile devices with them as they would a watch, wallet, or handbag. Many mobile device owners would be more devastated to lose their mobile device than to lose their passport. Mobile devices are personal.<sup>6</sup> As Siteworx's VP of User Experience Giovanni Calabro put it: "Mobile devices are an integrated part of life. People feel naked without their mobile." Or, as ninth-grader Courtney Johnson puts it, "I just don't feel like myself if I don't have my phone near me or I'm not on it."<sup>7</sup>

### Mobile Devices Are Digital Appendages

Mobile devices aren't just objects to be used when needed like a spatula, coffeemaker, or magic eight ball. Many mobile users keep their device with them all the time. Well-designed mobile devices and the mobile apps that run on them provide users with a:

- **Second brain.** Need knowledge, fast? Look no further than your connected mobile device to find information relevant to the goal at hand. Who was the British actor who was in that film about California wine?<sup>8</sup> Hmm, let me just look it up on IMDb.com. Mobile apps provide users with general knowledge but also provide them access to personal information on social networks, bank accounts, travel itineraries, and corporate calendars. eBay's RedLaser is one of the most popular mobile apps because it uses the device's camera to allow users to scan a product's bar code and finds information about the product, including online availability and pricing options (see Figure 3).
- **Remote control to the world.** Need to get something done right now? Thankfully, there is probably an app for that, or there will be soon. Mobile apps provide users with a range of functions that they need every day, like reading news or email, or need occasionally, like checking blood sugar levels with sanofi-aventis's iPhone app, unlocking the car with an OnStar app, or arming the home alarm using LifeShield's mobile app (see Figure 4).<sup>9</sup>

**Figure 3** RedLaser Helps Users Save Money

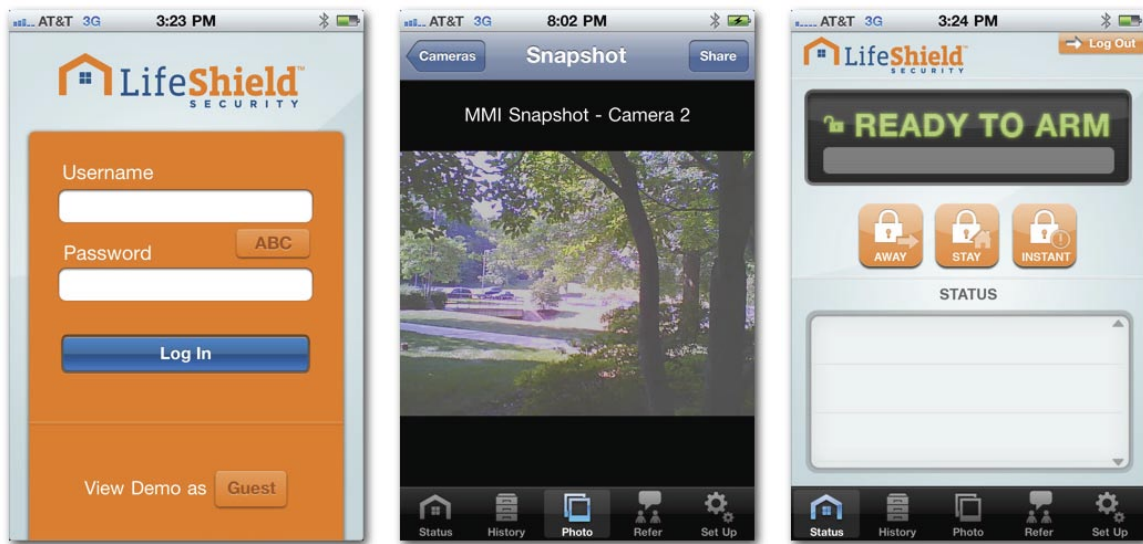


Source: eBay RedLaser Apple iPhone app

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Source: Forrester Research, Inc.

**Figure 4** LifeShield's Mobile App Allows Users To Remotely Control Their Home Security System



Source: LifeShield Security Apple iPhone app

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Source: Forrester Research, Inc.

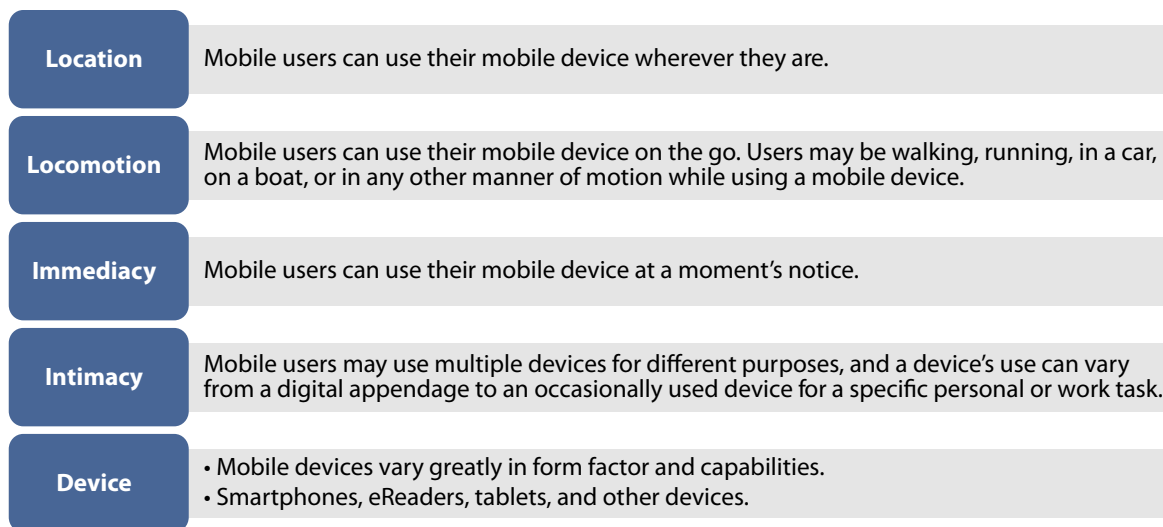
### LLIID: Location, Locomotion, Immediacy, Intimacy, And Device

Context is always an important aspect of user experience design because it describes the environment in which users might use the application and the features that would be most useful and valuable to them in that environment. Mobile amplifies the importance of context in five dimensions (see Figure 5):

- **Location.** People use apps in an unlimited number of locations (see Figure 6). And not all places are the same. A user may be in a quiet movie theater, at home in the kitchen, on a train, or in the White Mountain National Forest. Contrast this with desktop computers, stuck in places such as an office cubicle, home office, or kitchen. Laptops provide some mobility but are larger and less able to provide the immediate access of instant-on mobile devices such as smartphones, eReaders, and tablets. Location is a key dimension of context, driving different needs for users depending on where they are. Fortunately, GPS-equipped smartphones can use a geodatabase such as Google Maps to determine precise location.
- **Locomotion.** Mobile users also use their device while on the move — walking, running, swimming, dancing, and, dare I say, driving. While in locomotion, mobile users may have different needs than when they are stationary. For example, they may have only one hand available because they are pulling luggage through an airport, or they may have no hands available because they are driving. All new smartphones have GPS capabilities, and some have a motion-sensing capability that can detect motion, speed, and direction.
- **Immediacy.** Mobile users expect to have the right app at the right time. Because they are often on the go, they may need to use a mobile app immediately to find a price, transfer funds, or update their status. Better yet, a user will be pleased if an application can anticipate his needs based on location and locomotion. Immediacy is a key dimension of context because many mobile apps are event-driven, such as when users get into an auto accident and need to file a claim. The OnStar app that triggers a call when the air bags deploy is another good example.
- **Intimacy.** Mobile users identify with their mobile device, and you can and should take advantage of this personal nature in your app design. But the degree of intimacy and the nature of the relationship vary by user. Ida, a bargain-loving shopper, will not just respond but be delighted when you push an in-store offer to her device. Nick, a public works employee — not so much. Furthermore, Nick's work context may bring additional security considerations that limit the information you can provide to Nick, but not to his supervisor. Designing for intimacy requires you to understand each design persona's relationship with the device so you can define appropriate capabilities for the context.
- **Device.** One of the most difficult challenges of mobile UX design is the wide range of mobile device form factors and capabilities on multiple platforms and networks. Features such as gesturing, touch, voice recognition, and image recognition vary widely among devices. Device

context is key because developers must design apps to use only the capabilities that are available. They must also design apps to follow the platform’s conventions, which are different for Apple iOS, Android, and Windows Phone 7.<sup>10</sup> If an app needs a camera, will it work on a device with a low-resolution camera? Device capabilities are a moving target, too: Because device vendors keep inventing new features in a game of high-stakes “oneupsmanship,” app developers must always be on the lookout for new features to exploit.

**Figure 5** The Five Dimensions Of Mobile UX Context: LLIID



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Source: Forrester Research, Inc.

**Figure 6** Mobile Users Can Be Anywhere, Anytime, In Any Situation

Location	Situation
Doctors office	Being diagnosed by a doctor for wrist pain
On the street	On the job, managing street potholes
Fenway Park	Out of money
Electronics store	Browsing for a new video camera
Classroom	Listening to a lecture on Napoleon's ascension to Holy Roman Emperor
Car	Accident
Airport	Stuck at the Miami airport
Vacation	Fascinated by the Colosseum in Rome
Home	Trying to fix a pinhole leak in the refrigerator's ice maker
Meeting room	Listening to strategy status

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Source: Forrester Research, Inc.

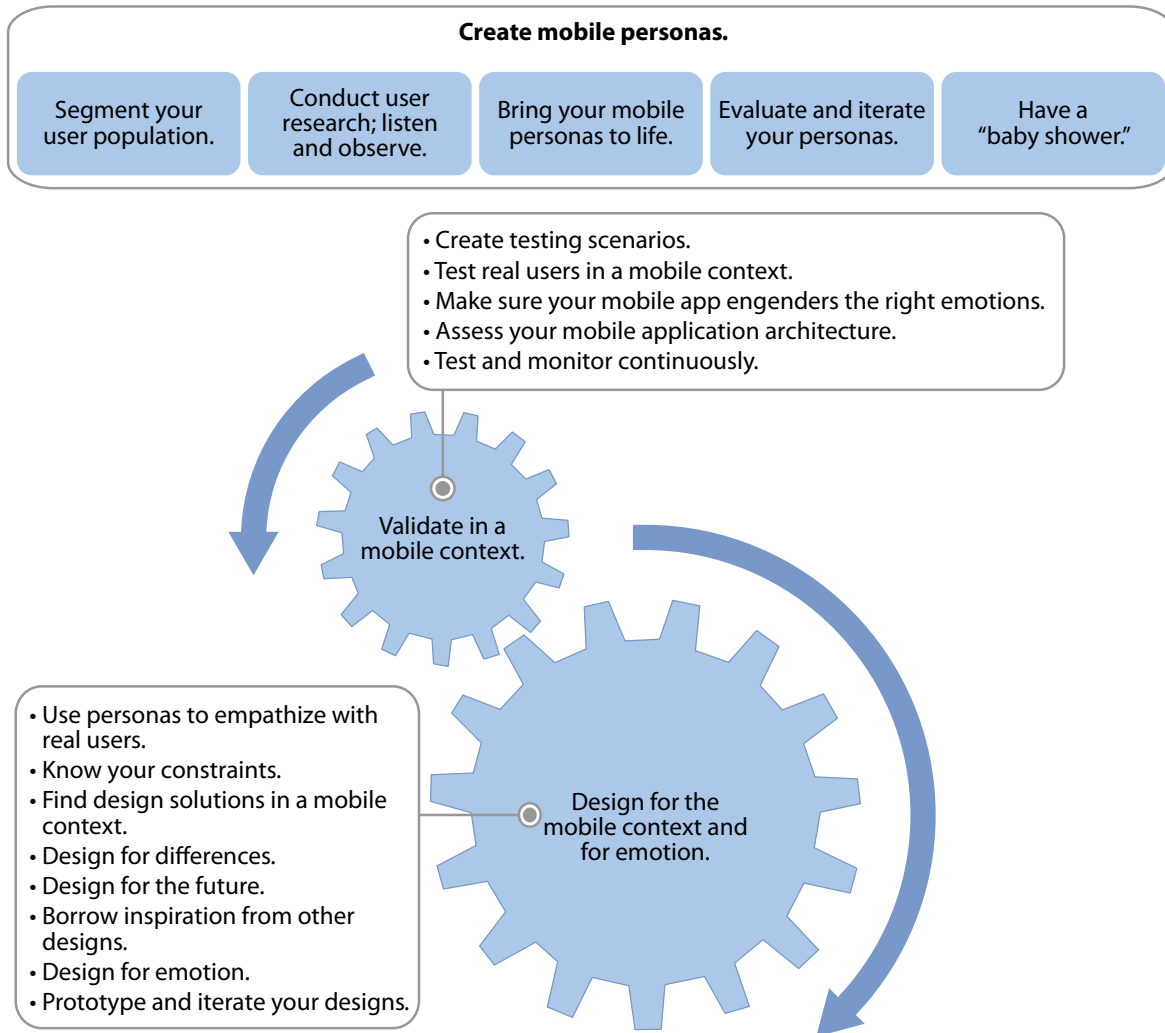
## BEST PRACTICES IN MOBILE USER EXPERIENCE DESIGN

How can you create compelling mobile user experiences that are useful, useable, and desirable for customers and employees? To find out, Forrester built on its existing research into user experience design best practices and spoke with leading experts in mobile application design.<sup>11</sup> Our efforts uncovered that mobile user experience design builds on existing user experience best practices to add the mobile context considerations of: location, locomotion, immediacy, intimacy, and device.

To make your mobile app desirable, follow these three mobile user experience design best practices (see Figure 7):

1. Create mobile personas of your users to know how to design for them.
2. Design for the mobile context and for emotion to design for love.
3. Validate your design in a mobile context to make certain your users are happy and that they love your app.

**Figure 7** Mobile User Experience Design Best Practices



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Source: Forrester Research, Inc.

### BEST PRACTICE NO. 1: CREATE MOBILE PERSONAS OF YOUR USERS

To design a great mobile user experience, you must deeply understand your users — their needs, wants, hopes, dreams, aspirations, attitudes, and goals relative to the app capability you will deliver. To find out what your users will really find useful, usable, and desirable, create personas that truly represent them. A persona is a vivid, narrative description of a named fictitious person representing a segment of your user population that you create to guide your mobile user experience design.<sup>12</sup> For example, Ida could represent a middle-aged woman who is a frequent bargain shopper using an iPhone. Nick could represent a public works employee using a Windows Phone 7 app to manage

potholes on New York City streets. Base each target persona on user research that uncovers real attitudes, goals, and behaviors. Personas give your entire team a consistent understanding of the target users, informing your design solutions (see Figure 8). To create personas:

- **Segment your user population.** Your mobile app does not have to engender love from every human being on the planet. Instead, it must be relevant to mobile users with the needs and desires it can fulfill. To segment your potential users, identify relevant characteristics of the population you wish to serve. Use demographics, needs, and the mobile context to narrow your population down to three to six defined target segments. A segment could be as broadly defined as all retirees with an interest in financial services, English-speaking teenage boys, or frequent travelers. Segmentation can also be more specific, such as patients with chronic diabetes in Florida, people who love horror movies, amateur commodity option traders, or users of a particular device or platform. The goal of segmentation is to narrow the scope of your population before you perform deeper user research.
- **Conduct user research; listen and observe.** Once you have defined user segments, the next step is to learn more about the users in each of your segments. Strong user research is essential to creating good personas (see Figure 9). Interviewing users directly is the best way to understand their needs, but you can also survey them, read existing research written about them, and review what they're saying about you and your competitors on social networking sites. When interviewing, be sure to ask open-ended questions: questions that do not assume a particular outcome or a particular way your app might approach solving a user's problem.

Users cannot always articulate what they need and what will make them happy. So don't just rely on what they say; you must also observe them in their natural habitat. Get out into the field and watch how users react to real-world mobile situations. What mobile apps are they using now? What situations do they encounter in which your mobile apps could help? Many of the most-successful mobile apps fill a need users could not articulate but that a designer was able to discover through direct observation. For example, shoppers were not clamoring for a mobile app to scan bar codes as they strolled through the store to find online prices, product information, and reviews, yet the RedLaser app boasts more than 7.5 million downloads.<sup>13</sup>

- **Bring your mobile personas to life.** Now that you understand your users, it is time to synthesize all of your segmentation and user research into three to six personas that represent the users for whom you will design your mobile app. A well-written persona is like a well-developed character in a story or a movie — the audience learns quickly about the character and that character's relevance to the story. In your case, the story lives in a mobile context. Persona descriptions typically fit on one page and include a name, photo, key attributes, and behaviors, with a focus on enabling design decisions (see Figure 10).

- **Evaluate and iterate your personas.** If your personas do not accurately represent your target users, your mobile user experience design will fail. Personas evolve through iteration just like any other artifact. Circulate your personas to stakeholders to solicit feedback, and then iterate your persona design. You have to get each persona right, while making sure that, taken together, the personas represent most of your target audience, without being excessive in number or complexity.

Don't get bogged down seeking universal acceptance. Lock in your personas once you feel you have them right, with the understanding that personas will keep evolving as you get new information that increases your depth of insight. However, be careful not to change personas arbitrarily. It's important that everyone gets to know the character and can make design decisions for the real users the persona represents.

- **Have a “baby shower.”** Personas are as important to a design team as a newborn baby is to its parents. Creating personas is a useless exercise unless you introduce them, so celebrate their birth by presenting them to your entire team. Some companies, such as Forrester Research, go as far as creating posters or even life-size cardboard figures of their personas.<sup>14</sup> To get the most from personas, you must design them well, integrate them into the design process, and ensure that your development team accepts them.

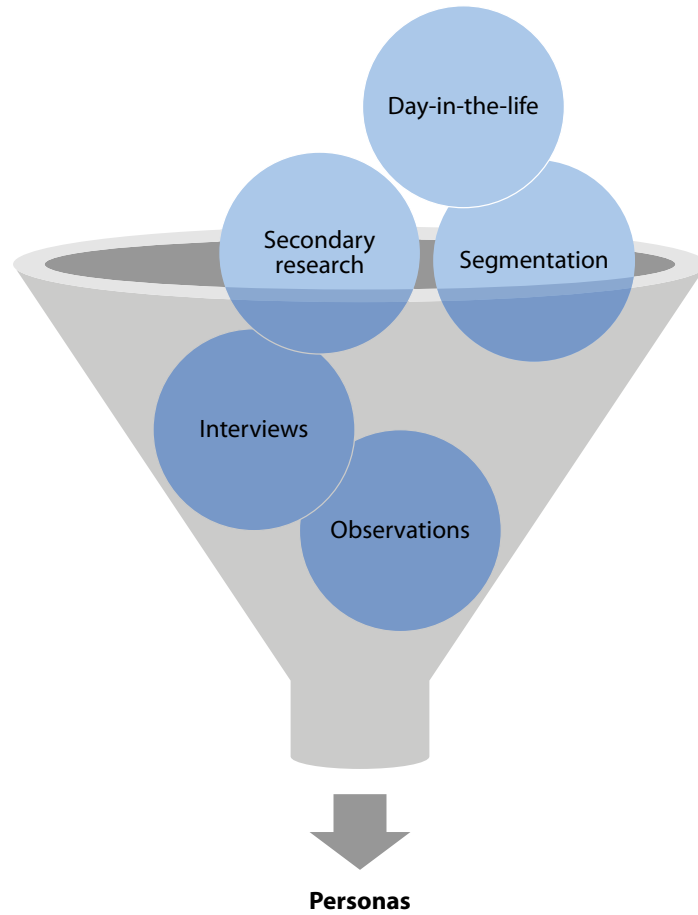
**Figure 8** Personas Keep Your Entire Team Focused On Designs That Resonate With Your Users

<b>Understand</b>	Personas provide your entire team with a consistent understanding of your target users and their most relevant characteristics.
<b>Empathize</b>	Personas provide a human face to focus empathy on the real people your personas represent.
<b>Ideate</b>	Personas help designers imagine what will be useful, usable, and desirable to real users.
<b>Prioritize</b>	Personas allow designers to prioritize features based on personas' attraction to them.

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**Figure 9** User Research Builds Strong Personas

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**Figure 10** Mobile Persona Checklist

- Is based on user research with real users  
Interviews, surveys, secondary research, and observation
- Describes a mobile context: LLIID  
Location, locomotion, immediacy, intimacy, and mobile devices
- Calls out key characteristics and high-level goals  
A short list of demographics, personality characteristics, behaviors, and situational goals focused on the persona's most relevant needs
- Includes a compelling narrative  
A short, well-written day-in-the-life story that encapsulates key behaviors
- Focuses on enabling design decisions  
Supports design decisions that promote a useful, usable, and desirable user experience
- Has high production value  
Well-organized, visually pleasing, and, most importantly, memorable

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Source: Forrester Research, Inc.

### Pitfalls To Avoid In Creating Mobile Personas

If your personas are not representative or accurate, your mobile user experience design will fail. When creating your mobile personas:

- **Don't assume that you already understand the user.** In the absence of real information about users, developers will engage their wonderful imaginations to model who they think the user could be. Then they'll design an app that serves the needs of their imaginary friend — but not necessarily the needs of any real-life mobile user. Mobile app stores overflow with such apps.
- **Don't just listen; observe and empathize.** Listening is not the only way to understand your customers; remember that it is just as important to observe them and empathize with them, especially in the mobile context. This will allow you to understand their overarching goals and think more creatively about how to help them achieve those goals now and in the future. Steve Jobs said: "You can't just ask customers what they want and then try to give that to them. By the time you get it built, they'll want something new."<sup>15</sup> Henry Ford famously said something similar in the 20th century: "If I had asked people what they wanted, they would have said 'faster horses.'"

- **Don't forget that the mobile context is different.** Many application designers and developers are used to designing desktop or laptop web applications. Mobile is different. Always keep in mind the mobile context: location, locomotion, immediacy, intimacy, and device. The mobile context should be a key aspect of defining and understanding your mobile personas.
- **Don't hide behind your persona.** To make sure that your personas represent real people, connect them back to real people. Stay connected to real people as you continuously validate your personas and refine your understanding of their nature. Can you easily bucket real people into your personas? It should feel natural to say, "Oh, she's an Ida" or, "He's a Nick."

## BEST PRACTICE NO. 2: DESIGN FOR THE MOBILE CONTEXT AND FOR EMOTION

R. Buckminster Fuller once said, "We are called to be architects of the future, not its victims." Firms should not leave mobile user experience to chance. Instead, they should design the mobile user experience and build a mobile application that delivers that experience. Design is part art because in designing, you have to find that differentiating *je ne sais quoi* that attracts customers.<sup>16</sup> But design is also part science because designers must take into account research on what has worked — and what has failed — in the past. Adobe Systems' Principal Product Marketing Manager, Enterprise, Ben Watson advises designers to: "Engage in playful exploration to raise the bar on your design solutions. Don't be afraid to fail."

To design a mobile user experience that is useful, usable, and desirable:

- **Use personas to empathize with real users.** You know your personas — now take a walk in their shoes, to feel their pain and their joy, to truly understand them.<sup>17</sup> What upsets them? How do they make decisions? Empathize broadly, but also empathize in context. The concerns of a busy salesperson will differ from those of a 17-year-old music lover.

To empathize with your users, pick a persona to impersonate, and get into character. Do a mental walk-through of the user waking up in the morning, going through her day, and using your mobile app. What motivated her to use the app? What was she thinking? What tasks did she want to perform, and how easy was it to do them? What other choices does she have for achieving her goals, and why did she choose your application? Finally, how did she feel before, during, and after using your app?

- **Know your constraints.** Make sure that your designers know their constraints before beginning the design process. Like everyone else, designers are constrained by time and money — but those are not their only constraints. They may also have technical constraints, such as the mobile device's form factor and capabilities or an underlying technical architecture that precludes implementing certain features cost-effectively or with adequate performance.

- **Find design solutions in a mobile context.** The mobile context must be top of mind when you ideate design solutions. Location, locomotion, immediacy, intimacy, and device form factor and capabilities are key design points for mobile apps. Design for LLIID, but in the context of the persona and the scenario (see Figure 11). Mobile users are often your customers in other contexts or channels. For example, your firm may also have a website and retail stores. You must design your mobile experience to support your overall brand and channel strategy and your customers' overall multichannel experience.
- **Design for differences.** It is likely that your user research uncovered the need to design for more than one mobile persona. That doesn't mean that each of the user segments these personas represent is equally important to your business. For example, you may choose to put more design effort into satisfying users who generate the most profit or users who have the most potential for increasing revenue — or you may prefer to focus your app on attracting a new set of prospective users. Once you've assigned a relative importance to each persona, you can prioritize the most important content, features, and functions to include in your app.
- **Design for the future.** Hockey great Wayne Gretzky is not a mobile app designer, but he has words of wisdom for designers: "I skate to where the puck is going to be, not to where it has been." Over time, a number of factors, including cultural shifts, economic realities, competitive offers, and technology, will change users' expectations of what is useful, usable, and desirable.

Therefore, design for change by getting insight into how your personas, business strategy, and the mobile context are likely to evolve in the future. Do this by coming up with a few future scenarios based on trends in context, such as competitors' announced intentions, technology adoption cycles, cultural shifts, and economic cycles. Then brainstorm how each of your personas will react to each of these future states. Now evaluate how well your current mobile user experience design can evolve to handle these future states, while bearing in mind the constraints of your technical architecture.

- **Borrow inspiration from other designs.** Design almost never starts from scratch. Review other mobile apps your target persona uses to learn what works and what resonates with him. Also look to other industries for ideas you can use in your mobile app, especially where it's relevant to your target persona. For example, if you are creating a mobile banking app for college students, by all means, look at your competitors' banking apps, but also research other, nonbanking apps that students use regularly.

New technology can also inspire new designs. For example, mobile devices that include thermometers can make restaurant menu suggestions that vary with the weather — soup on a cold day or a crisp shrimp salad on a warm day. A device with a camera and microphone might recognize individuals using facial or voice recognition, building on ideas from the world of gaming as implemented in Microsoft's innovative new Kinect sensors.<sup>18</sup> Because mobile devices

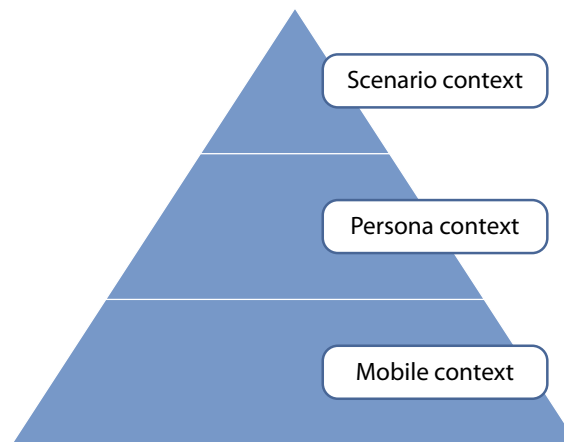
are points of convergence for so much technology, it's appropriate to look to adjacent fields such as gaming or robotics for inspiration.

- **Design for emotion.** You must make your mobile app lovable. This means you must not only make it useful and usable, but you must also be cognizant of how your users feel before, during, and after using your app. Determine the emotions you want your app to stimulate, using an e-map to analyze those emotional states (see Figure 12).<sup>19</sup> Once you determine your app's desired emotional impact, design visual elements and interactions that engender those emotions to make the app lovable (see Figure 13). For emotional design inspiration, think about the products you and your personas love and which features cause what emotions.
- **Prototype and iterate your designs.** Do not commit too quickly to a particular idea. Before you pick one of the options, subject it to some user feedback via prototypes and review it for fit against business objectives. You can use whiteboard or paper prototypes, or you can use mobile development tools such as RunRev's LiveCode to quickly develop a working prototype that will work on an actual device.<sup>20</sup>

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**Figure 11** Design For The Mobile, Persona, And Scenario Contexts

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**Figure 12** What Emotions Should Your Mobile App Engender?

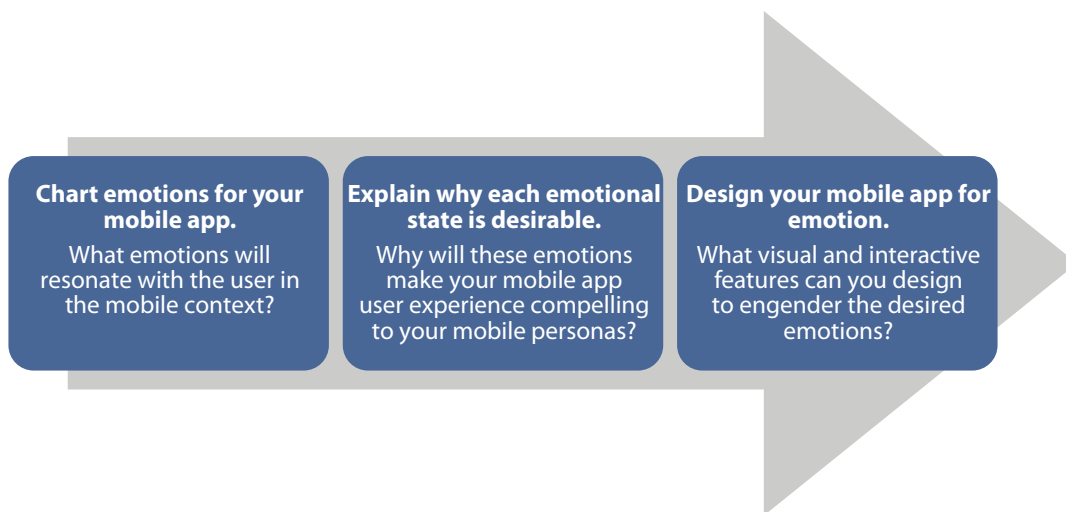
	-3	-2	-1	0	1	2	3		Why emotional state is desirable?
Reliant								Independent	
Vulnerable								Secure	
Uncertain								Confident	
Incapable								Powerful	
Apathetic								Passionate	
Neglectful								Compassionate	
Envious								Content	
Depressed								Optimistic	
Sad								Joyful	
Embarrassed								Proud	
Undesirable								Sensuous	
Routine								Adventurous	
Inconsiderate								Honorable	
Sparse								Luxurious	
Lonely								Connected	
Common								Distinct	

Source: Peter Boatwright and Jonathan Cagan, *Built to Love: Creating Products That Captivate Customers*, Berrett-Koehler Publishers, 2010.

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Source: Forrester Research, Inc.

**Figure 13** Design For Emotion To Make Your Mobile App Lovable



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Source: Forrester Research, Inc.

## Pitfalls To Avoid In Designing For The Mobile Context And For Emotion

When designing your mobile apps for the mobile context and for emotion:

- **Don't ignore your personas.** Remember, remember, remember to design for your personas. Many teams create personas only to forget that they ever existed. When making design decisions, always ask, “What would Ida think of this?” and, “What would Nick think of this?”
- **Don't diminish the mobile context.** Many application development professionals think that mobile apps are just a smaller version of an existing website or desktop application. This could not be further from the truth. Memorize LLIID: location, locomotion, immediacy, intimacy, and device — and design for these contextual elements.
- **Don't forget to design for all aspects of the mobile user experience.** Steve Jobs offers: “Design is not just what it looks like and feels like. Design is how it works.”<sup>21</sup> Design is not just about picking a color pallet that your personas might find pleasing or simply conforming to the slick look of the underlying mobile platform. Design requires visual, interaction, and emotion-focused design to create a mobile app that your users will find useful, usable, and desirable.
- **Don't forget to design for nonfunctional requirements as well.** Your users see what you show them in your app's visual and interactive features. But what they don't see can also affect their experience. For example, if a mobile app is too slow because of poor application architecture, users may abandon the app even though you designed it perfectly to be useful and usable. Mobile app designers must be sure that the app not only has a great user experience but also performs well and is highly available, scalable, easy to develop for and extend, secure, and cost-effective.<sup>22</sup>

## BEST PRACTICE NO. 3: VALIDATE YOUR MOBILE APP

Yippee! You have finalized your design and built a prototype. You are proud and excited, but take a deep breath. Despite your most disciplined efforts, there's no guarantee that your mobile app will be a raging success. Waiting until you launch your app to see how users will react is risky; it's better to validate your user research, user experience design, and mobile application architecture by testing. Before you let your mobile app loose:

- **Create testing scenarios.** Overtesting can be just as bad as not testing at all, because it may sap valuable resources or delay your app's launch. Focus your testing efforts on your app's most important and riskiest areas. Identify a few testing scenarios that cover both the user experience and nonfunctional requirements.
- **Test with real users in a mobile context.** There is no better way to know whether you got the design right than to test with real mobile users. Traditional usability testing, where users sit in front of a PC and a moderator asks them to perform tasks, falls flat when it comes to mobile

testing because it ignores the LLIID mobile context.<sup>23</sup> You must get your app into the hands of users who will use it in context and provide feedback. You can work with a small number of existing customers, or you might want to consider a “continuous beta” program.<sup>24</sup> In both cases, it is essential to get user feedback via an online survey or an interview.

- **Make sure your mobile app engenders the right emotions.** Just because you designed for emotions that you think will resonate with your users, that doesn't mean they will. Be sure that you ask your real users how they feel about the mobile app before, during, and after they use it, using open-ended questions to ensure that you are not telling them how they should feel.<sup>25</sup>
- **Assess your mobile application architecture.** The mobile user experience you design will run on mobile architecture comprising devices, infrastructure, and application platforms. It is critical that you assess your architecture's ability to support the user experience. Assess your mobile architecture for availability, performance, scalability, adaptability, security, and economy. To do this, have your architects and developers explain how their technical design decisions will affect each of the seven qualities: user experience, availability, performance, scalability, adaptability, security, and economy (see Figure 14).
- **Test and monitor continuously.** You should not stop testing after you deploy the application. Apps change over time because of updates. Users' needs and expectations change over time as well, causing the performance of apps with older designs to degrade even if the apps haven't changed at all. You can use mobile app testing services such as Compuware's Gomez, Keynote Systems, and Neustar Webmetrics to continuously monitor your mobile app's availability and performance. These firms test your apps by emulating a variety of mobile devices or using actual devices in a testing lab. Patterns that emerge may help you tweak your design.

You must also retest users' reactions to your app when you release changes. Consider implementing a continuous beta program with a small set of users who will continue to provide feedback you can use to tweak your design — or even to redesign, if necessary.

**Figure 14** Mobile Apps Must Achieve The Right Balance Of All Seven Qualities Of Great Software

Quality	What it means
1 <b>User experience</b>	Users' perceptions of an application's usefulness, usability, and desirability based on the sum of all direct and indirect interactions
2 <b>Availability</b>	An application's readiness to perform its functions when needed
3 <b>Performance</b>	The speed with which an application performs a function that meets business requirements and user expectations
4 <b>Scalability</b>	An application's ability to handle increasing or decreasing volumes of transactions, services, and data
5 <b>Adaptability</b>	The ease with which an application's functionality can be changed or extended
6 <b>Security</b>	Mitigating the risk of attack and ensuring confidentiality, integrity, authentication, authorization, and nonrepudiation
7 <b>Economy</b>	Minimizing the cost to build, operate, and change an app without compromising its business value or any of the other six design qualities

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Source: Forrester Research, Inc.

### Pitfalls To Avoid In Validating Your Mobile App

Resist the urge to skip any of the validation steps, and when validating:

- **Don't just test for bugs.** Finding and fixing bugs is a critical goal of software testing, but many development teams fail to test if users will love their application. Test for bugs, but also test whether the app is useful, usable, and desirable — initially and in every successive release that affects the user experience.
- **Don't rely on manual testing.** Testing successive releases of your app can be a pain. Make sure you build validation into your mobile application development life cycle so that you automate as much of it as possible.

## RECOMMENDATIONS

### GRASP THE MOBILE OPPORTUNITY TO INNOVATE

Mobile is the next frontier when it comes to developing applications that will serve your customers and drive business growth. Almost everyone is joining the cause. But firms that simply develop a mobile application to say "me too" are missing the boat. Mobile is a critical channel that your business can use to differentiate itself from competitors. Me-too mobile apps are not enough. You must develop mobile apps that your users will love — and, ultimately, so they will transfer that love to you by adopting your app.

## Use Location, Locomotion, Immediacy, Intimacy, And Device To Prime Your Innovation Engine

Innovation is often about providing services to customers in different ways. Mobile automobile claims apps such as those from Liberty Mutual Insurance and other insurance companies took a telephone- and forms-based process and made it mobile to provide existing services to customers in an innovative, new way. A good starting point to innovation, therefore, is figuring out if you can bring existing services to customers through the mobile channel. To do this:

- **Inventory your customer interactions.** Make a list of all your current customer interactions by category — for example, marketing, customer services, and sales. Don't just try to copy these interactions on mobile; instead, figure out how to make these interactions better in a mobile context. That might mean mobilizing a small slice of a current interaction or combining elements of multiple interactions to make it easier for customers to achieve a goal.
- **Ideate to find solutions.** The key to generating ideas for mobile apps is understanding your customers, their interactions, and the mobile context. You should create a persona or two of your current customers and then, considering the LLID mobile context, do a day-in-the-life walk-through interaction with your firm. Generate multiple ideas as rapidly as possible, and then focus on a few for closer examination. Don't be afraid to throw out ideas that don't work out based on closer examination. Keep iterating.

**Develop mobile apps that delight and dazzle your customers before your competitors beat you to it.**

### WHAT IT MEANS

#### THE FUTURE OF APPLICATION DEVELOPMENT IS MOBILE

Remember when application development teams got sideswiped by the Web back in the mid-90s? Firms faced the need to develop web apps, but their IT departments couldn't do it. So instead, they hired high-priced consultants to bring their business to the Web, and many application development teams found themselves marginalized. They eventually caught up . . . 10 years later. Now, here we go again, but instead of web, it is mobile. The future of business is mobile; therefore, the future of application development is mobile.

**Your second chance is here. Go for it.**

### ENDNOTES

- <sup>1</sup> The definition of mobile apps includes natively deployed apps as well as apps that run through the mobile platform's web browser. We consider both to be apps because both provide mobile functionality to users. "De rigueur" is a French phrase that means "necessary according to convention," meaning in this case that mobile apps are no longer considered optional; just about every company on the Web has at least one.

- <sup>2</sup> For a forecast of global smartphone and tablet apps shipments in US dollars through 2012, see the February 28, 2011, “[Mobile App Internet Recasts The Software And Services Landscape](#)” report.
- <sup>3</sup> For the latest trends in mobile development platform selection, please see the December 22, 2010, “[Mobile Development Goes Multiplatform](#)” report.
- <sup>4</sup> Holocaust survivor and Nobel Peace Prize winner Elie Wiesel famously said, “The opposite of love is not hate, it’s indifference.” App Store has more than 350,000 apps, Google Android has more than 250,000 apps, and Windows Phone 7 has more than 9,000 apps available for download as of March 2011. Source: 3G.co.uk (<http://www.3g.co.uk/PR/March2011/android-store-catching-apple-store-app-numbers.html>).
- <sup>5</sup> Droid is a smartphone mobile device that runs Google’s Android operating system and is sold by Verizon Wireless.
- <sup>6</sup> Mobile devices are personal digital assistants (PDAs). Remember the Apple Newton and the Palm Pilot? Unfortunately, they were ahead of their time because they did not have the device capabilities and connectivity of today’s mobile devices. John Scully, Apple Computer’s CEO in 1992, announced the Apple Newton as the world’s first personal digital assistant (PDA).  
  
Today’s mobile devices are PDAs, but more than 15 years later, they have more device sizes and capabilities as well as ubiquitous access to networks so they are almost always connected.
- <sup>7</sup> Source: Beth Teitell, “Connected, exhausted,” *The Boston Globe*, March 27, 2011 ([http://www.boston.com/community/moms/articles/2011/03/27/on\\_call\\_all\\_night\\_can\\_leave\\_texting\\_teens\\_tired\\_out/](http://www.boston.com/community/moms/articles/2011/03/27/on_call_all_night_can_leave_texting_teens_tired_out/)).
- <sup>8</sup> Alan Rickman, in “Bottle Shock.” Source: IMDB (<http://www.imdb.com/title/tt0914797/>).
- <sup>9</sup> Sanofi-aventis is a pharmaceutical firm. OnStar provides in-vehicle safety, security, and communication services. LifeShield provides home security systems and services.
- <sup>10</sup> Microsoft offers mobile developers a 101-page “UI Design and Interaction Guide For Windows Phone 7” that defines visual elements, device capabilities such as sensors, and other design-related elements. Source: Windows Phone, July 2010, Version 2.
- <sup>11</sup> To learn about Forrester’s best practices for designing great user experiences, see the September 4, 2009, “[Best Practices In User Experience \(UX\) Design](#)” report.
- <sup>12</sup> Alan Cooper introduced the concept of personas in his 1999 book, *The Inmates Are Running the Asylum* (Pearson Education, 2004). Since then, the practice of creating personas and using them to drive design decisions has caught on across a broad spectrum of marketing, product development and design, and customer service.
- <sup>13</sup> Source: RedLaser (<http://redlaser.com/>).
- <sup>14</sup> Forrester Research uses personas to design and deliver research products to specific client segments. For example, the persona Andrea Davies represents the application development and delivery role.
- <sup>15</sup> Source: MacStories (<http://www.macstories.net/roundups/inspirational-steve-jobs-quotes/>).

- <sup>16</sup> *Je ne sais quoi* is a French phrase that means “something indescribable.”
- <sup>17</sup> Constantin Stanislavski, the inventor of method acting, made famous by great actors such as Marlon Brando and Robert De Niro, offers some advice for empathizing with your users in his book *An Actor Prepares*: “An actor is under the obligation to live his part inwardly and then to give his experience an external embodiment.” Source: Constantin Stanislavski, *An Actor Prepares*, Theatre Arts Books, 1989.
- <sup>18</sup> Source: James McQuivey, “Get Ready For Kinect To Completely Change Our Lives,” *James McQuivey’s Blog For Consumer Product Strategy Professionals*, October 20, 2010 ([http://blogs.forrester.com/james\\_mcquivey/10-10-20-get\\_ready\\_for\\_kinect\\_to\\_completely\\_change\\_our\\_lives](http://blogs.forrester.com/james_mcquivey/10-10-20-get_ready_for_kinect_to_completely_change_our_lives)).
- <sup>19</sup> Source: Peter Boatwright and Jonathan Cagan, *Built to Love: Creating Products That Captivate Customers*, Berrett-Koehler Publishers, 2010.
- <sup>20</sup> LiveCode is a mobile application development tool that lets users create rapid prototypes for iPhone and Android devices. For additional mobile development options, please see the August 24, 2010, “[Define Your Mobile Development Strategy](#)” report.
- <sup>21</sup> Source: MacStories (<http://www.macstories.net/roundups/inspirational-steve-jobs-quotes/>).
- <sup>22</sup> Forrester has identified seven key qualities that all applications, including mobile applications, must exhibit. Forrester defines the seven qualities as, “the common requirements that all software applications must satisfy to be successful: user experience, availability, performance, scalability, adaptability, security, and economy.” For a detailed explanation of the seven qualities, see the January 24, 2011, “[The Seven Qualities Of Wildly Desirable Software](#)” report.
- <sup>23</sup> Traditional usability testing focuses on websites and applications that people access while sitting in front of a PC. Many of the usability best practices apply to mobile testing as well, but the biggest difference is the mobile context, which encompasses location, locomotion, immediacy, intimacy, and device. This makes mobile testing much more difficult.
- <sup>24</sup> In a continuous beta program, individual application capabilities, or features, are given as a beta release to a subset of the overall user population. Multiple features are in beta at any moment in time (for Netflix, the number is around 200). You may expose an individual user to some of those beta features, depending on the user’s profile, location, or other characteristics. If any beta feature fails, the session restarts at the point of interruption, with the original fully released feature restored instead of the beta feature.
- <sup>25</sup> Forrester published a report detailing how companies can adopt Emotional Experience Design (EED) to engage their customers in digital channels. For more information, see the January 18, 2011, “[Mastering Emotional Experience Design: Address Customers’ Real Goals](#)” report.

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