

Responsive, Mobile App, Mobile First: Untangling the UX Design Web in Practical Experience

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ABSTRACT

This experience report describes some recent experiences in user interface design for responsive websites, native mobile applications, and mobile-first designs for a corporation supporting multiple platforms, multiple products, and multiple customer types. In order to situate the information and comparisons, the paper includes discussion of certain supporting methodologies, technologies, skill sets, and approaches typical in each. Some of the expected and perceived benefits and drawbacks to these design methods are discussed in the contexts of various stakeholders. This discussion is not an attempt to define or teach these methodologies, but rather to examine certain relative merits and shortfalls of each in context.

Categories and Subject Descriptors

D.2.2 Design Tools and Techniques: Evolutionary Prototyping;

H.5.2 User Interfaces: Prototyping

General Terms

Documentation, Performance, Design, Human Factors, Standardization, Theory

Keywords

application design, architecture, big data, collaboration, contextual design, customer experience, design methods, design strategy, experience architecture, information design, information architecture, interface design, methods, mobile design, mobile first, native applications, responsive design, UI design, user experience, user interface, UX

1. INTRODUCTION

In order to keep up with an explosion of content across multiple platforms, “responsive design” is becoming a mantra for user interface designers and information architects in corporate web design. In responsive design, a user interface is set at “breakpoints” to adapt to different screen sizes (and, more recently, contexts). Virtually all aspects of a design can be adapted; navigation, layout, content, and interaction can all be responsive. On the surface, responsive design seems like it is not only the answer to the accounting department’s insistence on cost reductions, but also the product team’s pleas for broad coverage,

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the development team’s cries for constrained features, and the marketing team’s insistence on a unified message. And these (and others) certainly can be benefits of responsive design. However, the reality of implementing responsive design is not quite as simple as setting a series of breakpoints. Responsive design requires specialized skills in user interface design, user experience, and development. It also necessitates a high level of cooperation and collaboration (and iteration) throughout the product cycle(s).

1.1 What Is UX?

User experience and usability industry titans, Jakob Nielsen and Don Norman, describe UX as encompassing “all aspects of the end-user’s interaction with the company, its services, and its products” [17]. Not all associated with UX agree on this definition. For example, Laura Keller of Forrester Research, situates service experience outside of UX [12]. For the purposes of this paper, though, the Nielsen – Norman definition serves us well as a theoretical bound for UX.

With that broad boundary, it is helpful to identify some of the core areas of UX. These UX architecture (UxA), information architecture (IA), user experience design (UxD), interaction design (IxD), navigation design, user interface (UI) design, include user research, usability engineering, usability validation, and content strategy, which Jessica Ivins refers to as a “half-sister of UX” [8]. A latecomer to this party is UX strategy. Only recently have organizations begun to hire UX strategists (UxS). I categories these into four core areas: strategy, architecture, design, and usability. The boundaries of these areas are fluid. In some ways, for example, IxD is more similar UxS than to UI design. While roles are arguable, most agree on three basic principles of UX: Focus on the user. Measure. Iterate. [5] That first point is sacrosanct. In order to have a process that results in products and services that users need and want, the user must be a primary focus throughout that process [2], from idea through design, development, delivery, and retirement.

1.2 THE ROLE OF UX

User experience (UX) has evolved through several iterations from the early days of ergonomics and human-computer interfaces (HCI) with a focus primarily on the “C”—the technological aspects of human-device interaction [7], to an emphasis (almost solely) on the visual aspects of design (remember Flash?), to an architectural focus, to a focus on usability and user-centered design (UCD), then, finally to a more holistic approach to user experiences that are usable, useful, and desirable. Somewhere along this path, HCI, UCD, usability, and many of the other related terms have given way to user experience (UX) as the field has grown and developed in a more mature phase, encompassing and integrating these earlier concepts, functions, and roles.

UX, by its very nature, is interdisciplinary [7]. Having gone through this sea change, UX continues to struggle with where it fits in the organization, both in reporting structure and with regard to roles and functions. Arguments abound for UX as part of engineering, development, product, creative, or operational groups. UX can encompass many varied functions. In addition to the core areas defined previously, UX touches visual, information, web, and content design, application architecture, visual rhetoric (image and branding), content creation and writing, and analysis (business, web, and “big data” analytics), among others.

UX is growing quickly and is being implemented more than ever before. This rapid growth results in new ideas and concepts, which is great. Unfortunately, as Jonathan Anderson points out, such rapid growth also comes with processes and concepts not being properly “established, methodized, and universalized” and results in “a disorderly jungle” [2].

This experience report presents some of the current practices and trends within the rapidly-expanding and changing UX milieu, looks at three current approaches to design, and discusses some of these within the context of recent real-world experiences.

1.2.1 Role Confusion and Conflation

Our deliverables are not our roles. Because the UX field is little understood outside of user experience practitioners (and sometimes not then), jobs, roles, and responsibilities often are confused and conflated. Jonathan Anderson points out that many different roles in UX may produce the same or similar deliverables, including “annotated wireframes, user flows, personas, interaction designs, graphic comps,” [2] and so forth. This necessary overlap adds to the confusion, but is not really different than in other fields. Engineers may understand marketing. Technical writers may have some engineering skills. However, we do not expect or want our technical writers to engineer products, nor engineers to market them. Overlooking differences in and conflating roles and responsibilities in UX is equally problematic.

While UX roles tend to be more closely aligned with each other than the engineering and marketing roles in this example, they are nonetheless quite different. First, the approach and goals in the various roles differ. Even though there can be overlap in artifacts, the processes, focus, and objectives of UX differ significantly among UX strategy, user research and validation, architecture design, interaction design, UI design, content design, and so forth. Certainly, a UX professional in any role who is grounded in theory and focused on the user will have an understanding of the various objectives and outputs of the other roles. Many have performed those other roles, just as engineers may sometimes write technical documents. However, keeping a clear separation by focus is important.

This is particularly true for usability research and validation, which often is undervalued in organizations, performed *ad hoc* or by the designers themselves. Bill Albert likens “the risk of designers evaluating their own designs” to a fox guarding the henhouse. He states that this sort of self-checking often results in issues that are dismissed as not important or not communicated in an effort to save face. Designers validating their own designs results in a “conflict of interest that results in poor quality research” and “undermines the credibility” of UX and the UX profession [1].

2. PRACTICES AND TRENDS IN UX

In UX Magazine’s top predictions for 2015, Scott Plewes, UX VP at Macadamian, predicted that user experience would be seen as an important strategic move in organizations. Nailed it!

2.1 Agile Methods and Lean UX

Project management is moving to Agile methods. For UX, as for all other functions in the project scope, this means shortened cycles (*sprints*) for deliverables in iterative releases. Coincident with Agile, many organizations are moving to *lean* processes, a trend begun several years ago with lean manufacturing. Successful lean UX, according to Jeff Gothelf, incorporates team problem solving, low-fidelity sketching, rapid prototyping, cross-functional collaborating, and standardizing with design, code, and workflow repositories [8]. There are potential tradeoffs between Agile or iterative design and development and robust usability testing [1]. Lean usability helps to address some of those areas.

2.1.1 Lean Usability Methods and Tools

Jeff Sauro recommends using tools such as UserZoom and UserTesting.com in lean UX user research [20]. If you have “deep pockets,” Morae may be a good choice. There are dozens, if not hundreds of usability tools and methods at all levels of fidelity and across a huge price and feature spectrum. A survey and analysis of current tools would be a timely addition to industry scholarship. In the meantime, the key to choosing effective testing tools is to match methods and tools to what you want to learn [16] and, as Getto, Potts, Salvo, and Gosset point out, to ensure that the tool is appropriate for “the exigencies of the job at hand” [7]. For the purposes of this paper, we will look only at validation methods supported by the two tools that Sauro recommends.

UserTesting.com enables you to capture videos of user interactions with a web site and also provides a base of possible research participants that you can use for UX testing. They offer outsourcing to their own research team, which can be useful if you do not have a user research team of your own. An inexpensive alternative is to use Camtasia plus a screen sharing program (such as Webex) [16]. UserZoom provides task-based testing, click, tree, and timeout testing, card sorting, and surveys [20].

An important task in UX architecture is developing (and validating) ontologies. Ontological data informs low-level structures, taxonomies, and hierarchies and high-level UI elements such as menus. My favorite tools for designing ontologies are Visio and Excel. Old school, but effective. *Card sorting* is one method for defining and validating these foundational structures and identifying relationships among the sorted data. In card sorting, a test participant sorts terms into existing categories (*closed sorts*) or into groups and then names those categories (*open-ended sorts*) [16]. Two tools that offer online card sorting include OptimalSort and PlainFrame. In addition to numerous online tools, low-cost tools can be employed for card sorting. Card sorting exercises can be conducted simply with pen and paper, sticky notes, white boards, index cards, or any number of similar low-cost, manual tools [16].

Closely related to card sorting is *tree testing*. Tree testing is a reverse card sorting method. That is, an existing structure is tested. Tree testing is useful to validate navigation and findability. Tree testing lets you test a proposed hierarchy early in the design to incorporate changes before more costly work has been done. Because you use tasks to validate the tree, tree testing is sometimes referred to as task testing. Online tree testing generally is unmoderated. TreeJack offers an online tree test tool.

Like tree testing, *click testing* uses tasks for validation. In click testing, however, the focus is more on the experience of performing the task itself rather than findability and navigability related to the task. Click tests measure both where a test participant clicks as well as whether the task was performed successfully. ClickTest and Usabilla offer online click-tests.

Timeout testing looks at what users recall from a site or page viewed for a certain amount of time (usually 5 – 10 seconds per test) before the test “times out.” Timeout testing is useful to determine user recall, first impressions, and interest. UserZoom offers an online timeout test tool.

These are some tests and tools that have been popular recently. There are many more methods and tools, both low- and high-fidelity that are useful for testing and validation of UX designs. Whether the “tools come in commercial packages, open source packages, or in the form of pencils, paper, and post-it notes” [7], the takeaway here is that user testing is necessary and useful.

2.2 Service Design

Service design is relatively new to the full complement of UX. Kerry Bodine calls service design the “most important design discipline you’ve never heard of” [3]. Service design is a bit like the ‘red-headed stepchild’ of UX—or customer experience (CX). Service design tends to be more holistic, encompassing all aspects of service, all channels of communication. Service design also includes the processes, time, and spaces of service interactions as well as the interfaces, technologies, objects, and information that get the most attention in UX for products. According to Laura Keller, service experience (SX) “looks at the service as a system of elements with equal weight rather than a single channel that has priority” [12]. To name just one difference pointed out by Keller, SX prototypes “visualize the space” in which personas move” [12]. UX prototypes typical of product UX are mostly fixed-space designs.

UX for business-to-business (B2B) service offerings differs in key ways from UX for products. According to Tiffany Chow, the focus has to be on “interactions between actors” and business goals. In a project for which she developed a strategy for a service, Chow opted to not use the personas, features, and artifacts that are so useful in product-based projects. Instead, she focused on general groups, whom she chose to define as actors, the relationships among those actors (what Polaine, Løvlie, and Reason refer to as the service ecosystem [18]), and the decision-making and workflow processes and needs of those actors. Chow’s actor personifications encompassed the major stakeholders, including those involved in developing and selling the service as well as the enterprise client and end users. She refers to this as “developing an infrastructure” [4]. The workflow consists of general requirements, actions to address pain points, and intersections among actors and with the service. At this point, she employs the often-used artifacts of product UX: sequence flows, customer journey maps, and scenarios, tailoring them slightly for service engagement.

Companies like Uber are changing the perception and visibility of SxD, providing services and an entirely new service experience to customers on the move. New technologies, a holistic focus, and methodologies such as iterative design, agile project management, and lean UX are improving the ability of service providers to define, design, and validate modern service designs. Because a focus on UxD and SxD in services is relatively new, service design also has less of an issue with legacy design than does UX for products. Furthermore, because the very nature of service is

interaction with the service provider, capturing data to improve the design often is less intrusive and less costly than for products.

2.3 Contextual Participatory Design, Predictive Design, Anticipatory Design, and Cognitive Computing

In 2012, Dave Jones identified a trend in social gaming of the establishment of gaming communities, “local” invention within those communities, and “social web ecosystems” in which knowledge is made and shared. He refers to this concept as the “user experience of participation” [11].

Incorporating Latour’s actor-network theory, Liza Potts earlier looked at participatory information exchange in the aftermath of Hurricane Katrina and similar disasters, in which friends and relatives looking for loved ones were frustrated by one-way, closed communication from media, governmental, and NGO outlets. Within these participatory networks, actors (users) “build narratives” and make “literate” contributions to knowledge building [19]. User-contributed content, local invention, and networked communications lead to communities within the larger ecosystem in which knowledge is built.

Extending Potts and Jones, this concept applies in general to UX design. Design processes are moving away from silos of engineering and development into participatory design. Facilitating user design input can lead to cultural spaces that nourish contextually-based participatory design in everyday communications, products, and services. Interfaces can employ certain open design aspects and enable users to personalize their interactions, modifying colors, typefaces, and type sizes, relocating content boxes on the screen, hiding or surfacing content based on preferences, adding personal details, and so forth. This level of user personalization and customization already is a reality in many designs.

There is a further level of participatory design in which the design and the content served to a user is based on deterministic models. Big data, data mining, and data analysis are supporting technologies and methodologies for what we might call *anticipatory design*. R. Buckminster Fuller regarded all design as a means to solve problems by introducing artifacts (the designs) that “cause humans to abandon their previous problem-producing behaviors and devices.” In Fullarian design science terms, all design is anticipatory design. But I use the term here in a different sense, combining Fuller’s qualitative approach, the quantitative approach of data mining and analysis, and systems design. In systems theory, leverage points are critical places in a system where shifts in thinking, practice, design, or action can result in monumental changes in the system.

The most effective system leverage point is the paradigm [15]. The idea of a *paradigm shift* was popularized by Thomas Kuhn. Changing the paradigm changes the entire system. Combining predictive analysis and design, big data, and contextual participatory design lead to such a design paradigm shift.

This next step in design is *cognitive computing*. Cognitive computing refers to systems that utilize big data and learn from iteration. Cognitive computing builds on the last three decades of efforts in AI, utilizing representational analysis, natural language processing, ontological structures, and dynamic learning. The difference in cognitive computing that makes it feasible is that it iterates from and builds upon cumulative data (big data) rather than relying on programming algorithms. Designing for cognitive

computing systems will represent paradigmatic shifts in how we think about the system, the interface, the data, and the user. We are only now beginning to discover the implications.

2.4 Other Recent UX Trends

Compared to web and desktop application design, where there are myriad established design elements for specific purposes, mobile design, which began with minimalism and lean design in mind, has a smaller set of functional elements. Whereas a desktop application may have a button, a menu, and a keyboard shortcut that all do the same thing, a mobile application generally has one way to do something. But even with this smaller set of functions, designers have found many different ways to implement them.

When *hovering* technology became available in web designs, drop-down menus began to appear that implemented hovering. However, hovering to choose or expand a selection does not work well on mobile devices. Mobile designs have been abandoning hovering, and desktop designs are also changing hover menus into click menus [14].

One of the elements that gets much attention and hand-wringing is the *hamburger* or *3-bar* menu prevalent in mobile designs. The 3-bar menu long has been misinterpreted and misused. The 3 bars were intended to look like a list, not a hamburger. These menus now are being replaced with a menu box or button, often with MENU displayed on it.

Carousels that change content based on a timer are another element designed for desktops that made it into mobile designs and are now being replaced in both. The current trend is to design navigable, *swipe-based content blocks* instead of carousels. [14]

One of my favorite design trends (outside of kicking Flash to the curb) is moving from skeuomorphism to *flat design* [14]. Skeuomorphism's imitation of material objects is an ornamental artifact of early visual design in which it was helpful to mimic the "real world" objects to increase understanding. Now, we often replicate objects that many users have never seen. Take the Save icon: When did you last save to diskette? Flat design is a cleaner, minimalist trend that is timely and targeted for digital natives.

Finally, we are moving to *responsive web* rather than *m*. [14] ('em dot') sites. John McKinney talks about this as an outcome of responsive design. It actually represents *responsive development* (RWD). Minimalized em dot sites are designed specifically for mobile. RWD uses a single code base and serves the content accordingly. RWD is more complex, requiring significant up front planning and collaboration among designers, developers, product owners, and UX experts. Unlike RWD, em dot does not *scale*—that is, they are one-off, individualized sites. Each has a tradeoff. Em dot site may stick around for awhile.

3. MOBILE AND RESPONSIVE DESIGN

3.1 Mobile First

Many of the recent trends in UX are focused on *mobile first*, a design philosophy (from about 2011) that design should be created first and optimized for mobile devices. A mobile first approach may include mobile web, native mobile applications, or both. To create the ("desktop" web) designs, mobile first designs are either run as is on the larger-format devices, the mobile designs are modified (via responsive web sites, possibly in responsive designs) for desktop delivery, or completely different designs are created for desktop delivery. The mobile first strategy relies on the ubiquitous of mobile devices and massive

improvements in mobile network coverage and bandwidth. The strategy also assumes that customers—the market for the product or service—primarily will use a mobile device for access.

3.1.1 Problems with a Mobile First Approach

A mobile-first strategy can focus too narrowly on a single device or class of devices instead of the specific needs of the user regardless of device. One example of this is Uber. Early in their conceptualization, Uber determined that, because their customers are on the move when they engage the service and smartphones are ubiquitous in their target market demographic, Uber service requests would be available only via a native mobile application.

Uber learned two important things after their rollout. First, some of the customers in their demographic either cannot or choose not to download the mobile application on their phones. For example, my iPhone has insufficient memory to download an iOS that supports the Uber application. Second, a significant potential secondary market does not use smartphones. In a subsequent release, Uber added an m.uber.com site to provide the service on computers and phones on which the native application would not or could not be downloaded. This em dot site can be accessed via any mobile or desktop device with internet access.

As McKinney points out, such mobile optimized web pages were once popular for delivering a mobile experience for users, but have given way to code that recognizes the device and serves up an appropriate experience using a common page. (Again, this is responsive *development*, not necessarily responsive design.) But as Uber has learned, the need for a non-application mobile (and perhaps desktop) "web site" may continue for some time, even for largely mobile applications and ubiquitous mobile computing.

Mobile first has been focused on the primacy of mobile, sometimes excluding or inadequately addressing desktop designs. The UX community lately has revisited desktop design with the idea of tailoring experiences, delivering mobile and fixed designs that are appropriate for both the platform and the context.

Emma Lindahl talks about "accumulated experience" [13]. *Accumulated experience* is what users experience when they use products and services on different platforms in different contexts. We must ensure that we do not modify for the sake of difference. Sometimes, the leaner, meaner mobile design is not only appropriate for the typically smaller screen formats of tablets and smart phones, but also for our large-format websites as well.

3.2 Responsive Design and Development

Responsive design adapts to the size and medium of a device. In theory, one design is created that recognizes the delivery medium such as a web page or a smart phone. To accomplish this, designers set break points in the designs. When the coded product is accessed, it determines if the device is within or outside the breakpoints and delivers the appropriate design output. Platform-specific delivery is appropriate for all but the most entrenched desktop applications. Most people do not access their applications exclusively from "a large desktop all alone in a quiet space" [21].

The idea behind responsive design is that it is quicker and more efficient to design once and mark only differences for different platforms and that the resulting products are more consistent than they otherwise would be.

3.2.1 Responsive Design Risks

In reality, these two-in-one or three-in-one designs can be just as disparate and inconsistent as if they were three completely separate designs. Furthermore, doing a good job of responsive

design (and back-end coding for responsive designs) is much costlier in terms of time for the initial design.

Focusing on consistency across platforms “fails to recognize that the situations that we use the different devices in are, in fact, already built into the devices that we’re using” [13]. We may want to offer a “different, more lightweight experience” on a mobile device rather than “the desktop overload version” [13].

Responsive design is not responsive development. Using presentation-level tools like Axure, it is possible to create a lovely, interactive, responsive design that actually impedes development of the product or service due to more complex design source, inadequate annotation (relying on the developers to reverse-engineer the prototype), lack of correlation between design elements and development code snippets, and the one-off, unique nature of the created prototypes.

Responsive design is hard. Not only is the content and format a consideration for different platforms, but navigation, messaging, and branding also must be addressed [13]. And perhaps most important, there should be a business reason to implement responsive design. If the back end developers cannot utilize it and the other team members do not care about it, it ends up as a white elephant that is difficult and expensive to maintain.

4. ADVENTURES IN USER EXPERIENCE

With this situating information in mind, let us look at some recent real-world UxD. Although one could persuasively argue that a year in UX is more like “dog years” than calendar years, we will, for the purposes of this report, consider the second quarter of 2014 to be “recent.” At that time, I was contracted through an agency as a consulting IA for a very large telecommunications provider. We will refer to them as *BTG*, for *big telecom guys*.

BTG has a strong focus on consistency across UX. The Creative team maintains Visio templates, a design elements widget library, and an associated code repository for native mobile application and mobile web designs and, to a lesser extent, for desktop web designs. These are complemented with detailed design guides that provide additional information about when, where, and how to use certain elements (and when, where, and how not to use them).

The design libraries and code repositories at BTG are used across all product lines. They are linked together and maintained by senior UX designers and developers, respectively, who function in staff roles outside the purview of specific projects or programs. In order to introduce new elements for a project or use elements differently, an IA (UxD) must get approval for the elements from an executive-level Design Board. The IA designs are then refined for both mobile and desktop, associated with code, and added to the libraries and repositories. This is a non-trivial exercise.

4.1 My Role

The title of my role and related conversation with the agency is indicative of the rapid changes and relative upheaval in UX. When I received the recruiter’s call, my first question was, “Yes, I am an IA, but what do *you* mean when you use that term?” I wanted to know if we were talking about the same thing. Many hiring organizations treat the various UX roles such as IxD, IA, taxonomist, strategist, UI designer, web developer, front-end developer, visual designer, customer experience (CX) analyst, business analyst, and, occasionally, usability researcher as if they are interchangeable. Most require cross-functional skills, and many UX folks function in more than one role. But they are not interchangeable. We discussed expectations and deliverables.

Although the role was actually UxD, not IA, it was squarely within my areas, and we agreed on terms.

My first few days at the client site reinforced our common understanding of the objective, which was to design the structure, hierarchies, and data (the “architect” part of IA), workflows, and interactions (IxD and UxD territory) for the user interfaces (UIs) of five projects within a common program. The work did not include visual design, except as required to mock up any new elements, which would be refined and introduced by the Creative team. My deliverables were predominantly wireframes, which the client requested be created in Visio, and flow diagrams.

4.2 My Projects

The client designs were to be “mobile first,” focused on a native mobile application and mobile web first, followed by separate desktop web designs. The projects introduced new contextual designs using a “tenure” approach that surfaces content based on whether the user is a new, established, or departing customer. My primary projects were designs for the two new tenures for pre-installation and departing customer experiences. The contextual approach relied heavily on mining, analysis, and interpretation of BTG’s massive “big data” stores of customer demographics, behavior, and history as well as market insights. In order to design the experiences, I worked closely with the big data team to help them understand what data was needed to populate the designs. The other IA on the team worked on new personalization features for the tenures. IAs participated on Agile teams for the projects, which were managed as a program using waterfall methods.

4.2.1 Project Issues

Restructuring a couple of months into the projects resulted in a leadership change from a senior creative director (SCD) who was on the Design Board and managed UX for several product lines to a newly-minted associate creative director. The ACD decided to scrap all of the Visio wireframes that had been done so far on the five projects and move to responsive design in “interactive” Axure prototypes. The ACD cited his reason for moving to prototypes as a need to “sell” the designs by showing interactivity.

Unfortunately, decoupling the designs from the established processes resulted in some issues. BTG does not maintain design or code libraries for prototypes (typically used only for early proof-of-concept designs). All of the designs and the development coding had to be re-created from scratch, a costly and time-consuming task. The tool in which the designs were re-created has a steep learning curve, and it creates one-off objects in which design elements are not easily associated with code. This resulted in additional work for design and development. Before design hand-off to development, designs need Design Board approval. These were regarded as new, whole project designs instead of the iterative, incremental design typically submitted. This resulted in a long lead time for approvals. And with no code associations, development had to interpret the designs and create new code. In addition to the change to prototypes, the projects and program were managed as an Agile-waterfall hybrid. This resulted in significant waterfall overhead that further slowed down the iterative projects.

BTG’s last-minute move to prototypes from wireframe design deliverables and the overhead introduced by hybrid project management resulted in delays and missed windows for usability testing. As Bill Albert cautions, wasteful overhead obscures the real goal [1], getting “user input into the design process” [20]. Without this, there is no usability.

5. CONCLUSIONS

Industry is beginning to realize that UX applies across virtually all aspects of an organization—all products, all services, all artifacts—and cooperates with all functional teams. UX must be part of the organizational strategy, built in from the beginning of the product lifecycle, and constantly iterated, rather than added as an afterthought or undertaken as a massive overhaul.

Responsive design is a popular buzzword in UX, but we must ensure that we are using it in the right contexts and for the right reasons. Although responsive design can be useful in the long run if all functions are aligned to make use of it, implementing responsive design is difficult and costly up front. It is important to weigh the time, costs, and results against the goals and objectives of the design projects and how the designs will be used. Be sure that you are not merely making nice-looking prototypes that have no actual association with development efforts. Smoke and mirror prototype designs not only slow down the overall design and development process, but also divorce front-end and back-end development from design, which can result in the developed product or service looking and behaving very little like the “demo.” That said, polished, interactive demos have their place—typically as marketing and evangelism tools, not as UX tools.

Although she is co-opting a technical term, it is important to keep in mind what Emma Lindahl says with regard to responsive design. “Designing the best experiences across platforms means being responsive to the user, not the device” [13]. While I agree that the user must always be at the forefront, I would extend this to say that it is necessary to situate a design for all stakeholders. In addition to meeting user and business needs, design deliverables should be created using tools and methods that facilitate handoff and implementation within the design and development process. That includes useful annotations, workflows, and correlation with the user stories, requirements, and other project artifacts.

UX focus is on producing usable, useful, and desirable user experiences. With the advent of big data analytics and adding cognitive analytics, particularly self-learning analyses, to this mix, UX is moving to a cognitive computing model. The challenges of that model for UX have yet to be identified. As UX continues to mature, grow, and adapt to these new paradigms, UX practitioners will need not only to be well-versed in the concepts, methods, theories, technologies, and ontologies of UX, but also in “the complexities of humanistic approaches to both technology development and problem solving” [7].

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