



# UX DESIGN

Transcript

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# **LESSON 1: BASICS OF UX DESIGN**

## Defining User Experience

In defining user experience, it's useful to think about what it is and what it isn't. This is a quotation from Apple founder Steve Jobs in an interview he gave in 2003 about the origin of the iPod, which had a profound effect, not just on Apple's fortunes at the time, but in how people perceive technology and in how they should interact with it. To give this statement its full context, Jobs full quote was this, "Most people make the mistake of thinking design is what it looks like, people think it's this veneer that the designers are handed this box and told, 'Make it look good.' That's not what we think design is. It's not just what it looks like and feels like, design is how it works." The interview is still available online and we've included a link to it in the lecture notes of this presentation.

Nielsen Norman Group are one of the world's largest UX consultancies, and they have defined user experience in this way, "User experience encompasses all aspects of the end user's interaction with the company, its services, and its products." You'll note how broad reaching and comprehensive this definition is. Mentioning all aspects of the end user experience. Clearly, this goes well beyond a simple interface. We all become end users as we begin to interact with a product or service. Wikipedia similarly gives a far-reaching definition, echoing the words from Nielsen Norman Group, "When any one of us sit down in front of a computer, lift our tablet or mobile phone and visit a website or use an app, we have become users of a service. Every interaction we have with the website from our initial impressions through to leaving the site and our recollections of it afterwards all contribute to the user experience we've had."

Let's look at an example from the real world. Sometimes we seem to want to go out of our way to confuse people. In this example, which is an entrance to a public building, we have told people two things they shouldn't do. And this of course begs the question, "Well, what should I do?" We need to appreciate that people don't like to be made to think too hard about things, particularly when it comes to online activity. Digital is supposed to make our lives easier, so why would we ever consider doing the equivalent of this online. And yet, it happens more often than you might think. Before we get into design for the web specifically, let's look at another real-world example in a little bit more depth.

This comes from a designer in the US called Pete Smart. Over a period of two months in 2013, Pete had been on 13 different flights and he noticed something that many of us might overlook. He noticed that boarding passes were by and large very badly designed. Pete didn't stop there, he thought about and defined the problem he was having with the boarding passes. He looked at the collection of strangely ordered acronyms, oddly formatted times and sequences that required a lot of effort to decode and understand. He felt this should be a lot easier to use and that boarding passes should ease stress for the traveler, rather than adding to it. So he went about redesigning the boarding pass. And this was his result.

You'll notice firstly the switch from the familiar landscape format to a portrait format, and importantly, Smart set himself some constraints. In terms of information, he felt the solution should try to include all of the information carried on existing boarding passes. In terms of format, the result should use the same standard dimensions of the existing boarding passes also. Finally, the solution should be capable of being printed using only black ink and to not increase the cost of printing for airlines. Smart included a clear hierarchy of information. The content on the boarding pass is presented logically so the passengers can quickly scan for relevant information. Care was taken to space and group information well, and he retained a simple three column grid to keep the information well structured. He also thought about information that would assist the user after their journey, such as whether they might need their coat at the other end. And finally, Smart included nice touches to

make the boarding pass more usable overall. If the boarding pass is folded along the line of the tear-off strip, the boarding pass can then fit comfortably inside a passport and the key details of the flight are available at a glance without having to constantly open and close a passport.

So while the solution is great, consider the approach to the problem that Pete Smart took. He questioned what has been in use by countless passengers in order to create a better, more usable output. This kind of approach using design thinking is applicable in all sorts of contexts. By asking the right questions, by defining the problem more clearly, we can create better experiences for users and consumers.

## Elements of User Experience

So let's look at the discipline of UX and the component parts that go into creating an online experience for an end user. This diagram by Jesse James Garrett, an American UX professional and founder of UX agency, Adaptive Path, is from the year 2000. In it, Garrett set out to show how a user experience is built up in layers with appropriate elements from different contributors coming into play at various times. You'll notice that the diagram encompasses business analysis, technical and content requirement analysis, interaction design, information architecture, navigation, interface design, and finally, visual design. It is crucial to understand that we sometimes hear the acronym "UI" used interchangeably with UX. UI stands for 'user interface' and refers only to the visual layer that is presented to the user. 'UX' is the entire experience. To echo Steve Jobs again, design is not just what it looks like and feels like, design is how it works. This table by UX designer Steve Psomas is not unlike Garrett's; however, the emphasis here is on breaking down the constituent contributions into granular elements. You can see much more clearly from this breakdown the sheer amount of activity that goes into creating a positive user experience well outside of how it looks.

The contributing disciplines to user experience involve research, business analysis, information architecture, interaction design, content strategy, visual design, and even front-end development. All of these can have an influence on the quality of the end user experience. When the World Wide Web arrived in the late 90s and became part of our daily lives, suddenly the wider population was interacting with what was essentially software but which hadn't yet matured. Early websites were usability nightmares, unprepared for the job that they had to do. Usability was now center stage and the web provided not just the demand for it, but with so many people using and interacting with it, the web also provided a mass of insights into how people interact with online systems, which in turn helped to refine and mature the discipline. User experience inherited many approaches from behavioral psychology, cognitive science, human-computer interaction, and of course, design itself.

All of this serves to illustrate that a UX designer needs at least an appreciation of the contributing factors to user experience. This doesn't mean they need to be an expert in all of them, but they should have a specialism which folds within the wider skill set. Another important skill is knowing when each of the activities should come into play. It's difficult to define a typical UX project, and the goals within different projects can be quite disparate. While optimizing the conversion rate of an e-commerce website might involve an amount of usability testing, for instance, to see if usability issues are affecting conversion, a dedicated usability project will call on a slightly different skill set.

One of the key elements of user experience design is understanding the different facets and challenges within a business or organization. Silos within organizations are one of the primary barriers to good user experience. As customers, we like to feel as if we are dealing with an organization as a single entity. When interdepartmental issues or tensions become apparent to end users, it erodes their confidence in that company's transactions. Consulting and listening to different challenges within an organization will lead to better understanding of the challenges which might be involved in

offering a seamless or joined up experience to end users, and also give those contributors a greater sense of ownership over the project. Good communication is an important skill for any professional, but listening and understanding is particularly key in user experience design. Understanding the problem or challenge which UX work needs to address is a foundational activity in any UX project.

Starting a UX project should involve putting together a plan of activity. This describes the types of activity that will take place within the project, detail what the purpose of the project is overall, and how success might ultimately be measured. This can be as straightforward as documenting what improvements are being offered to users in terms of an improved experience, and similarly how the business or organization can expect to become better as a result of the project. The project plan can be a simple table listing these various elements. Stages of the plan should articulate research activity, analysis, prototyping work, and design outputs. The project plan can demystify the process for others and help to set expectations. It may not always be required, for instance, where UX activity is limited and where resources will not be available.

Improved user experience can result in huge benefits to a business's bottom line. This quote, taken from a Fast Company article in 2012, offers a figure of a return anywhere between \$2 and \$100 for every dollar invested in user experience design. The figure stems from a source at IBM, who when talking about their software, added, "For every dollar spent to resolve a problem during product design, \$10 would be spent on the same problem during development and \$100 or more if the problem had to be solved after the product's release." Numerous industry studies have gone on to corroborate and further clarify these figures.

Another of the world's largest UX design agencies, Human Factors International, have come up with a number of return on investment calculators which can be accessed using the link in the lecturer's notes of this presentation. So good user experience is good business. People simply prefer products or services which reduce friction or make things easier. For all of the information we have given previously around the disciplines contributing to UX, the purpose of user experience work can simply be to remove friction and pain points for end users, to save them incremental amounts of time or effort versus competitors, and in this way to make their lives just that bit easier. We all like it when that happens.

## **Core Disciplines**

Another useful document at the outset of a UX project is the UX design brief. This document can work in tandem with the UX project plan to detail basic information, such as business needs and user needs. It can further summarize and set key expectations for the project along with key performance indicators, the benchmarks by which the success of the project will be measured and which will be positively affected by the project's outputs. By summarizing key elements of learning from stakeholders, the design brief removes ambiguity from the project and defines the goals of a UX project. In conjunction with the project plan, these documents can offer welcome clarity to the work ahead and what the desired outcomes are.

Without research, UX design can amount to nothing more than guessing. Insights from research help UX designers to make informed decisions, and thus make the design more effective. Research can come from any number of sources, including web analytics, analysis of previous usability tests, eye tracking activity, A/B testing, or surveys of relevant users, to name just a few. Effective design can't be created in a vacuum, and a UX designer must have a clear idea of the type of users they're designing for to help focus and target their work. One of the most useful tools in this process is user personas, which offer a number of archetypical users of a website and their associated needs and goals. With this information, design decisions taken are much more likely to be the right ones. While

we place a lot of emphasis on user needs in a user experience project, the needs of the business must be considered in parallel.

Let's revisit Jesse James Garrett's elements of user experience just for a moment. The foundational elements in Garrett's model are user needs and site or business objectives. It is vital that both of these are clearly defined before work begins. The business must benefit from the project in a manner which can be articulated and measured. The business goals should offer value to the business while offering clear value to the user. This value exchange is the heart of user experience work.

To put it simply, for any customer that wants to use a website to achieve a certain outcome, making it easier and more pleasurable to use will only assist the business over time.

## **Adopting the Right Mindset**

This quote from American professor and marketing guru Theodore Levitt dates back to the 1960s and may well be familiar to you if you're active in marketing. What Levitt is saying here is that benefits win out over features. People want to know what they can achieve with a product or service rather than what the product does. The same goes for websites. Users don't want to visit websites and spend time on them without an outcome of some sort. Understanding what those outcomes are for users will fall out of research and insights and bring us to the concept of tasks and goals. Designers should consider a user's goals, and the tasks which those users will need to carry out in order to achieve them. A goal, for instance, might be to order a new phone online. The tasks involved in achieving that particular goal will likely be a process of searching, reviewing, comparing and assessing, and finally, ordering. It certainly won't be a one dimensional activity of inputting credit card details.

If designers can deconstruct the process the user goes through into smaller tasks and then assess the challenges and pain points a user encounters in the carrying out of those tasks, the better prepared they are to create a better overall experience. These details matter, and this is fertile ground for user experience work. Using the example of buying a phone online, let's look at three of those tasks from a user's point of view: searching for options, comparing different models, and finally, ordering. So when searching, we might want to provide search mechanisms. We might want to ask, what do users start their search based on? What are they looking for initially before they begin to get into more detail? How might we make it simpler for a user to initiate a search and how could we better present search results? When comparing models, what criteria do users base their comparisons on? How can we make it easier for users to scan and identify this information? Is there functionality we might use to make comparison easier? And finally, ordering. What other elements might a user want to add to their order? What kind of delivery options are they hoping for? Are there any additional costs we should make the user aware of?

These are just small examples of ways in which we should look at these online processes. By asking these questions, we begin to understand the user's point of view. And by demonstrating empathy with the user, we can design more effectively for them. A UX design process can often produce an excess of documentation. And as we work through a process, it's worth bearing in mind that our work as designers is unlikely to be the end of the line. Whether we're working in an agile or waterfall environment, we need to be efficient in what we're handing over or passing on.

Synthesis of our work is as much a skill as the work itself. There may be particular constraints around what we are to produce in terms of a budget or of what can be achieved technically. In the end, what we supply must represent our work. Wireframes might be requested as an ultimate output, but any

amount of work can have played a role in producing it. There are few substitutes for an in-person presentation to add detail to what a single deliverable might not be able to communicate. Minimum viable output is a good approach, supported by validation. Deliverables are not the goal; an effective outcome is. In short, outcomes beat deliverables every time.

## **Trust and Credibility**

Let's now look at trust and credibility. Let's imagine you wanted to take some parachute lessons. You see the sign advertising the exact service you want – does the sign make you want to use this particular service? What is it about it that makes you doubt their ability to get you safely back to the ground? Establishing initial trust with your audience is crucial. Users will not interact with what they don't trust. The credibility of your website will play a huge part in this process. As detailed, users arrive at a website with questions. They also arrive with expectations about what a site will provide and how it will provide it.

User experience starts with these expectations, understanding them, meeting or surpassing them, and managing them where appropriate. In terms of initial impressions, basic design principles can address the vast majority of issues around trust and credibility. Principles such as consistency and accessibility, affordances and signifiers can get over the majority of trust and credibility issues. We'll return to this theme of trust and credibility later in the module.

This site is actually live on the web and we've included the URL in the lecturer's notes of this presentation. It's a little like a website equivalent of the parachute sign we looked at a moment ago. So as you look at this, ask yourself: Would I buy from this website? If not, why is that? And based purely on looking at this website, would you want to use it or perhaps would you visit a competitor to see what their website offers?

Trust is established through some simple approaches: Offering feedback opportunities, providing clear navigation, presenting your value, quoting the user accurate numbers, advertising privacy policies in terms of service, avoiding sales language, and avoiding misspellings and broken links.



# **LESSON2: UX RESEARCH AND DESIGN SKILLS**

## Information Architecture

Another of the key ways in which we establish trust with the user is in how we enable them to navigate through our website. You'll know of course that this is a process of clicking links, images and other interactive elements to work towards particular content we want to get to. In the physical world, traffic signs are primarily designed and placed for people who may know where they want to get to, but not necessarily how to do it. They may be sure of their destination, but unsure of the route.

Designing websites is very similar in that we should not assume that users either will know how to get the content or will persevere until they find it. The structuring of information to enable people to navigate through it is called information architecture and it is a core discipline of user experience work. Information architecture involves being able to group content into meaningful categories, logical sections with associated labels which adequately communicate the content that sits behind them. This type of work can be a mammoth task, but thankfully there are exercises that can contribute to the process and give designers insight on the way forward directly from users themselves. These exercises are card sorting and tree testing.

### Card Sorting

Card sorting allows users to group and label a set of content items that they are given. There are two types of card sorting, open and closed card sorts. In open card sorts, participants are free to label the groups that they create as a part of the exercise. This approach requires a much lengthier period of analysis as there will be many different ways in which participants will have grouped the information. The alternative is a closed card sort where main categories are predetermined and participants asked to place content within these categories. This requires less work both from participants and from UX professionals. Card sorts can be carried out in person, either with individuals or small groups.

There are also online systems, which allow tests to be carried out remotely. These include optimal sort, UX sort, simple card sort, and user zoom to name a few. This approach facilitates large numbers of participants to contribute to the process, which improves the integrity of the data and the potential for an optimal outcome from the exercise. Card sorts will yield patterns of placement and reveal a lot in terms of where users expect to find particular items of content. Results from optimal workshops card sorting package optimal sort feature these kinds of outputs. Asked to group content items in a closed sort, this metric shows where the most popular placements occurred in each case.

Depending on the percentage of placements, the card sort will offer either confidence around placement of the content within a structure, or it can prompt a review of the labeling of either the item representing a web page or type of content or the category name itself. Other aspects of analysis will look at all the other placements for individual content item and the significance which those have. Ultimately, the structure will be for use by the majority of users and we can never expect a 100% success rate from these tests. As a rule of thumb, 75% or above for placement of an individual item within a single category can be taken as adequate validation of placement.

### Tree Testing

Tree testing, also known as reverse card sorting, is another participative exercise that can help designers make better decisions about content structure, taxonomy and naming conventions. Whereas in a card sort where participants distribute content across categories, tree testing asks participants to locate specific items of content within a tree structure. Tree testing deals only with

test labels. So participants don't see any of the cues or sign posts they might normally see while they're on a website and in that sense it is abstract, while that brings an absolute focus to the tree structure. As with card sorting, tree testing can take place in a moderated scenario or online using relevant software packages. These include Treejack by Optimal Workshop, UserZoom's tree testing software or C-Inspector. Results from Optimal Workshop's tree testing Treejack look something like this. Based on a task related to finding a particular item of content, the software records aspects of the user's journey towards that content, including how quickly they located the content, whether their first click was relevant, whether they backtracked during the exercise and more.

This is rich material for UX designers, allowing us to see how a user expected to be able to get to their content. By referring to these results, we may end up relocating an item of content within a structure or providing sign posts to content and places where there was ambiguity about its placement. These tests are useful not only for establishing whether an overall information architecture is right, but also for providing good insights into typical customer journeys.

## **User Journeys**

On any given website, there will be a limited number of core user journeys which reflect the use of the website by a majority of users. User journeys will mirror the main user goals for the site and will bring users into contact with key decision points and onto the site's key pages. These are the pages that will define the user's experience. Each of the waypoints on a user journey can be examined and, when combined with task modeling, which we look at later, the act of deconstructing user journeys enables designers to mold and shape the user experience based on all of the touch points or steps that users take on the site. And for users, navigation is the tangible manifestation of information architecture.

## **Site Search**

The use of the search mechanism on a website can create a very particular user journey in itself, or it can form an aspect of a broader user journey. By that I mean that search is usually opted for through one of two main behaviors, either as a first resort – this would be where users arrive on a website and use search straight away as the primary method of reaching specific content – or as a last resort. This is where a user may have tried to use the main navigation options on a website and having failed to locate their content, they turn to search as a final attempt to find what they wanted. In each case, and particularly the latter, it can be difficult to meet user expectations in this area. Google has set expectations of the little white search box so high, that anything less than superlative search performance can feel like a disappointment for users. Search should never be over-promoted as an option for users, unless you can be sure that the functionality matches what it promises.

Let's take a look at this website which is a huge online repository of recipes. The site clearly offers search as the primary interaction on the homepage. This type of design became popular based on every and this previous design which offered a large search box on its home page to simplify the process of initiating a search. So given that the whole user experience is predicated on search, what happens when we search for something uncommon? This is the page we're presented with when we search for whelks. The page is badly designed in a number of ways. As a user I need to work hard to find out that there have been no matches to my search. The information that tells me this is lost in the middle of the page. Meanwhile, the site is busy trying to advertise to me with a banner ad and then presents me other recipes which have no connection with my original search. The website makes no attempts to make even a partial match or offer suggestions of what I may have been looking for.

This demonstrates some of the pitfalls of using search as a primary interaction and then badly handling a zero results match. In short, it promises much in terms of taking me straight to desired content but delivers very little if my query doesn't meet with what the site can handle. These exceptions need to be considered every bit as much as the core user journeys.

## Visual Design

We now turn to visual design. The surface layer, as Jesse James Garrett put it in his elements diagram we looked at earlier in the module. All of the decisions made up to this point should still stand and the addition of the visual design layer should not overturn anything that has been agreed, tested or validated up to this point. To put it bluntly, if the application of visual design makes any significant alteration to those earlier decisions, then the project team may need to reassess its priorities.

We have been at pains to say that we should avoid thinking about this stage until the right time and now is that time. Visual design will play a crucial role in establishing the trust and credibility with your users that we mentioned earlier in the module. Many of the immediate decisions which users make about whether to engage with a product or service will be made based on their initial perceptions. However, this shouldn't be interpreted as an invitation to try and wow users into a sense of submission by overloading them with graphics and animated elements. In most cases, the best job that visual design can do is to simply reassure users that they have come to the right place, to a website that they can trust and then to stay out of the way while a user goes about their tasks.

Let's revisit this website at [arngren.net](http://arngren.net). Look at the number of colors on the page, the sheer density of information on screen and the poor quality imagery. This is everything that the visual layer shouldn't be. It is at once too much design and yet not enough. Good design should seek to reduce the amount of visual elements offered to the user. More does not necessarily mean better. And while this is an extreme example, there are many other websites which do this because they haven't gone to the trouble of deciding which elements should be removed from the page. As we have seen from that last example, color is a significant design element. Unlike any design element it can be used well or misused.

When working with brand guidelines in particular, color will need to be used in a very specific manner. Establishing a color palette will be an important part of the design of a website and it should be used with purpose. While it can take its lead from brand guidelines, color can be used to guide and prompt users. Colors such as red or green can be very significant, particularly when it comes to buttons which prompt an action or colors which denote something important. It's a simple fact that people like consistency. Creating websites which are consistent both within themselves and with the wider web will only garner greater trust and credibility with the user.

For instance, if you visited a website and every page on that site used a different layout or a different navigation system, you would begin to lose trust in it. Layouts are consistent for the benefit of the user and for the business. Websites which use layout grids at their foundation are easier to build and easier to maintain over time. Once a grid system has been introduced, it becomes easier for those who work on the site subsequently to conform with the standards established for that site. New pages added to the site can follow the same grid without becoming dull or formulaic while offering a credible interface to the user. This is an example of a layout grid from Wikipedia. Notice that the layout is based around a number of columns visible from the guidelines shown here. Visual elements can span these columns and the boundaries of columns can be used for alignment of visual elements, which only adds to increased consistency. These grids are something which web design took from the world of print design, particularly news media.

Newspapers would always feature an underlying grid with a number of different columns which offered the flexibility to accommodate large amounts of frequently changing content without losing the underlying integrity of the layout. The reason why conventions from the wider web are important has been best put into words by usability expert, Jakob Nielsen. His first rule of internet user experience states that users spend most of their time on other websites. This means that your users prefer your site to work the same way as all of the other sites they already know. That's how they come to know how the web works and they don't want to relearn that when they come to your website. Over time we all develop what is termed a mental model of how things work. This influences our expectations and our needs.

Breaking the mental model by being too different from what most users usually encounter will break the user's mental model and create friction and unnecessary questions in the minds of users. This doesn't mean homogeneity of design. It simply means consistency. If we look at something like car design it makes sense that the main controls of a car are in the same place from manufacturer to manufacturer. And most cars conform to conventions that have been established over time. Designing for the web is no different. Think of how the logo appears in the upper left on most websites. Our navigation tends to peer in a strip below the header or the site's search box appearing in the top right on most websites. To borrow Jakob Nielsen's point about most users spending their time on other websites, most of the content on the web is made up of text. While there are certainly other major components of web content such as images and video the amount of our time on the website is spent reading or scanning text. In that light the way that we treat text in our designs is fundamental to the user experience.

None of us want to use the world's best looking website only to find that the text is too small or that the font used is illegible. And so the art of typography, the technique of laying out and displaying text becomes another core skill of the UX designer. Historically, a certain proportion of graphic designers have tended to favor small text sizes or colors which mute the text and give it a subtle treatment. This is fine, but the ultimate measure should be legibility and accessibility. Indeed, there's legislation in many countries which applies to the accessibility of text on websites. One of our mantras as a UX designer should be to make things easier for the user and this includes the ability to read and absorb text content. A very useful tool in creating sustainable and consistent designs is something called design patterns. The term design pattern relates to a reusable form of a solution to a common design problem. As with a number of approaches and techniques, web design inherited this approach from software development.

Design patterns used throughout a website create a form of visual vocabulary and help users to interact efficiently with an interface. Design patterns can be anything as straightforward as including a logo in the top left corner of a website or including contact information in the footer. They can encompass common input elements across commonly performed tasks. Design patterns emerge over time as best practice. And though we may not realize it, we would all be lost without them. In short, design patterns take away the need for designers to reinvent interface elements every time a website is created, which offers a reassuring consistency to the end user. The BBC in the UK are a publicly funded organization, and as such they offer a very high degree of transparency around the work they do. Their web team in particular are very open about sharing their approach to design problems. The BBC have published what they call their Global Experience Language which features a dedicated design pattern section. In this they document a number of key interactive elements that feature across their family of websites, the purpose of each and how each should be implemented in context.

The BBC are not the only organization to do this, and many useful design pattern libraries are available across the web. Bootstrap systems such as Twitter's Bootstrap or Zurb's Foundation also

feature these pattern libraries at their core. A number of very helpful websites also compile their own examples of design patterns from right across the web and become great reference points for designers. We mentioned text earlier as one of the main content types on the web. Images are another of those fundamental elements and without which the web would be a poorer place. Like all web elements, images can be a help or a hindrance. They can be used well or misused. Editorial imagery can bring a written piece to life. Good photography can influence whether a user will continue with purchasing an item they are considering. Infographics have become increasingly popular over time based on their ability to succinctly summarize and communicate a large amount of sometimes complex information in a condensed format.

One of the most common uses of images across the web is using the image as a centerpiece on the page. In these cases, to remove the image would be to remove most of the design. And while this is a commonly used design device, the designer should always consider the implications of using such large images. Usually large images have correspondingly large image sizes which places demand on a user's connection speed and bandwidth. This may not be the best approach particularly in a mobile context. This is an example page from Google's Material Design style guide. In Google's words, the style guide is a visual language for our users that synthesizes the classic principles of good design with the innovation and possibility of technology and science. Google's goal in creating this style guide was to develop a single underlying system that allows for unified experience across platforms and device sizes. While not many organizations have Google's resources, more modest versions of style guides can have a profound effect on the overall integrity and consistency of a user experience. Similar to design patterns, style guides create a reference point for design across a particular website. A good style guide will summarize not only the design elements to be used in association with the site, but the design principles that work in and around those elements. Style guides provide guidelines and constraints within which designers can work. And as with design patterns, they offer a sustainability of design. If any parts of a website need to change in future or new pages need to be added, designers can consult a style guide, then refer to design patterns in order to make effective design decisions. These are highly effective ways to make a website's design consistent, trustworthy and usable.

# **LESSON 3: UX PROTOTYPING AND TESTING**

## Overview

We look at ways in which we can create designs that are effective and match the needs of users. Prototyping is the term we use for creating early versions of a website or product. Effective prototyping means understanding what users are trying to achieve, as we mentioned earlier, and this means thinking in terms of user goals and top tasks.

Task models help us to understand the steps that users take as they work towards their goal. By deconstructing these tasks, we can develop a highly detailed picture of the interactions that are required to get users to their goals. Task models can reveal user expectations and help us match the system to those expectations. They can help us to streamline the user interface design and improve later product versions. The better we understand these steps, the more effective our prototypes will be, and the better the final website will be. Prototypes can come in many different forms and can begin at the very early stages of a UX project. Even sketches can qualify as prototypes. As long as the output moves the project along by contributing to better design decisions, it has earned its place as a prototype. The prototype should only be as functional as it needs to be to allow some form of testing or validation to take place. Fidelity refers to the level of detail and amount of rendering applied to the output.

Let's take a look at a few different types of prototypes and the role they can play in the design process. We mentioned sketching a moment ago. Paper prototypes are one step back from wireframes, which are created without any involvement from pixels. They're low-cost, they encourage exploration, and they avoid perfectionism, which can be damaging to progress on a project. Sketching out basic layouts is a good skill to have and can help to quickly work out or rule out several options very quickly before even launching a software package. Sketch versions of a website can even be used for user testing if they've been created to a certain standard.

One of the best ways to think about these sketches or paper prototypes is that they are describing the interface rather than rendering it.

## Wireframes

Wireframes are the form of prototyping most commonly associated with UX design. Wikipedia's definition says that a website wireframe, also known as a page schematic or screen blueprint, is a visual guide that represents the skeletal framework of a website. In fact, Jesse James Garrett used the very term 'skeleton' at that phase of a project. Wireframes are the most common form of prototypes associated with UX design and they allow decisions on layout or content to be taken before visual design or branding has been applied. They can facilitate discussion about those issues and allow a project team to focus on the important issues of hierarchy and prioritization before visual design comes into play.

## Prototyping

In this example, we have a low fidelity wireframe. As you can see, this is a very simple layout showing the main content blocks on the page, where the visual emphasis should be, for instance any calls to action that need to be highlighted for the user. Using something as simple as this, we can adequately communicate a basic layout, a visual hierarchy, and relative priorities on the page. We can also indicate different media types, such as video, text content and images, as shown here. These can begin to prompt early feedback or gain broad agreement on the direction the design needs to take before too much time is invested in rendering the page in any great detail. This is the same page



rendered in higher fidelity. In this version, we've started the process of filling in the design with greater detail, including the style and amount of copy appearing at various points on the page. Again, while images have begun to be represented and some modest styling has been added, discussion and feedback should continue to be focused on the fundamental elements of the page, rather than becoming fixated on brand or visual design. And that's the real strength of wireframes, and UX design in general, removing subjectivity from the discussion, and ensuring that what is being offered to the user reflects the goals for the project without the distraction of what shade of blue or red should be used in the design.

## **Functional Prototypes**

Functional prototypes begin to come into play later in the design process than the other examples we have looked at. These begin to build in actual functionality end users or testers interact with. Functional prototypes are not usually embarked on until there is a much higher degree of confidence about what is going into the designs with no surprises waiting at the next iteration. That confidence should be derived from having tested earlier versions of lower fidelity prototypes. The rule of thumb is to test early and test often.

There are a multitude of options for creating prototypes of all varieties, depending on the requirements of the output. Desktop software installed on a local computer might include drawing or painting packages, such as Sketch, Adobe Illustrator, InDesign, Azure, or Visio. Packages such as OmniGraffle are particularly orientated towards the production of schematic line work. Sometimes using a less feature-rich software package can keep you as a designer focused on producing work that answers requirements without the distractions of needless features designed for much higher fidelity design work. There are also a number of very credible web applications which offer extensive capabilities in the areas of wire framing and prototyping, and these include Balsamiq Mockups, Hot Glue and Mockingbird. Many others are also available which have increasingly sophisticated functionality.

Because of the nature of wireframes, they can even be created in packages such as PowerPoint or Keynote; however, this isn't something we recommend. The important thing is to use the software or system best suited to the output you require, the right tool at the right time.

## **Interactive Prototypes**

Creating interactive prototypes is much easier now than it used to be. A number of notable online applications have been created specifically to remove the need to be able to code and create interaction. Basic interactive prototypes can include clickable layouts with simple hotspots applied that link between different layouts simulating the flow of key user journeys. More sophisticated options offer a full simulation of web functionality, right down to individual web components such as drop-down lists, buttons, or rollover effects. Many packages offer the ability to do this using a drag-and-drop system. And while this makes the process of creating sophisticated prototypes much easier, it also increases the potential for over designing websites and losing the essence of what is being created.

One of the very welcome features that many of these web applications offers is the ability to share prototypes online and gather feedback at the same time through commenting systems. This can be very useful in centralizing feedback on prototypes, rather than attachments being endlessly distributed and forwarded on email. We have listed a number of the most prominent packages available today in the lecturer's notes of this slide deck.

## Usability Testing

We now come to testing and validation, a central concept in making good design decisions and bringing a design ever closer to the goals that were established for it at the outset. Testing and validation can offer input at any point during the design process, and as we mentioned earlier, testing early and often is the best approach. Usability testing is one activity at the very heart of good user experience. It is in fact the most effective tool in evaluating an interface against the measures that were set for it. Usability is objective, and crucially it involves real users from outside the project in order to achieve that objectivity.

Usability testing can be conducted in a moderated capacity, on-site, or remotely online. A usability test can offer both qualitative and quantitative data, for example whether specified tasks can be completed successfully, the length of time taken to complete the specified tasks, and the level of satisfaction with a product or service. The conclusions from the test can point the way towards alterations or changes required to improve performance in facilitating tasks and goals. Moderated testing is a form of usability tests where a moderator sits with a participant and asks them to perform certain tasks, taking the opportunity to make inquiries about the user's choices or expectations. Moderated testing is useful in that it permits the moderator to ask those questions of the participant during the test. The moderator must be careful not to lead or direct the participant during the test, something that can make their past results null and void. Moderated testing is more time-intensive, in that it requires a very particular setup and can involve the recruitment of specific relevant participants to take part in the tests, something which can be a job in itself.

Unmoderated testing is an alternative form where the participant is remotely asked to perform certain tasks in isolation, thinking out loud as they proceed while video footage of their screen activity is recorded for later analysis. The benefits of unmoderated testing include that it is efficient and requires less budget. Potential drawbacks include that it places limitations on the degree to which a tester can communicate their intent or actions. In short, you take what you get from the test with no option to intervene or make inquiries of the user as they conduct the test.

There are other forms of testing that allow for very specific tests on designed to be undertaken. During a five-second test, an interface is shown to a participant for five seconds, after which that person is asked a number of questions about what they saw. Five-second tests can deliver top-level findings about an interface including its most prominent visual elements, the user's initial assessment of a product or company proposition, or the main navigation options that the user perceived to be there. While these may seem like very minor inquiries, the significance of the five-second test shouldn't be ignored. Users make very quick initial decisions about whether or not to engage with a website or service. As in this quote from Entrepreneur Magazine in 2012, sometimes the timing of decisions comes down to microseconds. The old adage, "You don't get a second chance to make a first impression," is not too far from the truth when applied to web design.

But remember, these decisions are not based on the amount of lavish visual design applied to the website or how big the logo is. A user's assessment will be much more nuanced than that, whether they realize it or not. Five-second test can begin to gather the type of data that can reveal issues with that initial assessment. Click testing offers designers the chance to test where users click first when given a set task or content to find. Click testing can be carried out on low fidelity or high fidelity prototypes, depending on the nature of the task. It might be used to test navigation elements, but similarly it can be used to discover if users can locate content on other parts of a webpage, or if specific terminology and labeling are effective in communicating a particular concept. Click testing is

one of the ways in which designers can decide on the location of individual visual elements within a design.

Preference testing is as it describes. It is a record of the preference of a test participant against two versions of a design. The two versions are presented to the participant, and they select the one that resonates most with them. Data from preference tests should not be taken in isolation as validation of a particular design. Ultimately, it is only based on preference. It is no guarantee that a design will be effective in increasing conversion rate, for instance. So the results from preference tests should be corroborated with other data sources.

A/B testing involves two variants of a web page or interface element being displayed to different users concurrently. This is similar to preference testing only in it that involves two versions of a design. The variants will be presented to users without their knowledge that another version is also available. Studying the analytics on the relative performance of each option would provide insight on which is more effective in furthering the goals for the design. A/B testing might offer insight into, for instance, the placement of a call-to-action button or the layout of particular content, such as a product information page.

Another form of this test is known as multivariate testing, where multiple variations of a design are used with the goal of finding which combination of designs will be most effective overall. This is a simple example of an A/B test where a color change of a button has been tested and found to have had a profound effect on user behavior. While differences of this magnitude may not be so common, it is not unusual for A/B tests to yield a clear and unambiguous answer to the debate around elements such as this.

Eye tracking is a highly-sophisticated technique which records and measures the movement of a user's gaze across a screen. The applications for this in UX design are clear. Eye tracking can provide insights on gaze placement, where the user is looking, and the length of gaze, how long they look at those items for. Eye tracking results in the form of a heat map, as shown here, can reveal overlooked elements. They can also shed light on how users scan and absorb information. Eye tracking might be used to offer insight on the layout of a design right through to the placement of individual interface elements.

# **LESSON 4: IMPLEMENTING GOOD UX DESIGN**

## Homepage Design

A website homepage will be the single most visited page on the vast majority of websites. However, only around one third of visits to websites begin there. This is due to the power of search engines and the inclusion in search results of pages other than the homepage.

The ultimate role of the homepage is to provide an effective starting point for all key user journeys, no more no less. While the homepage may be the most visited page on the website paradoxically, the user may spend the least amount of time on it. For most scenarios the concept of browsing a homepage does not feature as a key user task. In most instances, users want to find the path to their desired content as quickly as possible. Users will arrive at a website with questions that they want answered, whether these are expressed consciously or not. The questions may be fundamental and easily answered. UX designers can gain insight on what a homepage should include through user testing or analyzing data on internal site search. What are people looking for that they can't find? Perhaps there is a place required on the homepage for elements that appear consistently in these internal site searches.

So what kinds of questions might a user come to the homepage with? As mentioned, these can usually be easily answered, but very often they're simply not. Let's look at some typical examples for an e-commerce website. A user may be asking themselves, "Can I find what I'm looking for? Can I find something that interests me? Do I really want these products? Can I get them at the right price?" But at the heart of all these questions is the recurring one on the topic we keep returning to, "Can I trust this company?" Most of the other questions are answered in a straightforward manner like pieces of content. The answer to the last one is multifaceted, as we have seen so far.

The stated business goals for a website as a whole need to be reflected on the homepage. This will require careful prioritization and handling of content. However, as the homepage represents valuable screen real estate for organizations, internal competition for representation may be high. This can expose some of the departmental friction mentioned earlier in the module. Very often, this can lead to the inclusion of a carousel or slideshow on the homepage, purely to keep every department in the business happy by having them represented on the homepage. The core proposition of the business needs to be established from the homepage in either unambiguous text or an effective use of photography. The top tasks and goals of users also need to be considered and provided for.

Let's look at a couple of very different examples of homepage design. In this example, taken from a university in the UK, the homepage is dedicated to the Vice-Chancellor's Distinguished Lecture Series. This is how this website appeared during a very important time in the university calendar. It was in the months leading up to the application period for universities, and the primary audience for the website at this time would have been prospective students. And yet, we have to look very hard indeed to find a suitable entry point for that audience. This is a case of getting priorities and content decisions wrong. I'm delighted to say that in the months since this screen grab was taken, the site has since been updated and features a much more relevant initial proposition to site visitors. In this example, you'll notice that the homepage content is a lot more sparse. While there is a major promotion in effect, this is not part of the carousel. The company has been able to decide on the most important content and go with that alone. Crucially, the key tasks of the user are front and center on the website. The mechanism to search for flights is easily discernible and the user will not need to work too hard to do what they came to the website for. The promotional banner may or may not interest them but regardless the top user tasks are well represented here.

Returning again to the recurring theme of trust, a user's degree of trust can mean the difference between the user leaving the site within a short space of time or becoming a loyal customer. Content elements on a homepage which promote trust can include testimonials from existing customers or clients, easily located contact details, endorsements or membership of professional associations demonstrating a company's standing in its industry. In this example, note the use of imagery, which is included without overpowering the main call-to-action buttons on the page. The image is also of a human face, which has been proven over time to increase engagement with users. One key expectation users will have is that the website homepage will reflect up-to-date content. This is crucial in reflecting the vitality of the business or organization behind it. Content elements, which improve the contemporary appeal of a homepage, can include recent new story summaries, links to recent blog posts, or integration with active social media channels.

On that last point, it is important not to try and reproduce social media content in total. Websites and social media are very different channels. Websites should not simply be a vehicle for social media content but rather reflect the activity on those channels in a reduced format. The homepage should give priority to the most important user journeys. In this sense, it acts as a springboard to other content and is not an end in itself.

The homepage must provide easy access points to top content and top tasks, and should not try to reproduce too much internal content. Users will need enough of a sign post to start them on their particular journey after which the website can begin to offer them much more specific information relevant to their needs. In the earlier years of the web, the homepage was seen as being the single most important page on a website from which all success would spring. That is clearly now not the case for all the reasons we have detailed in these last few slides. Dedicating too much design time or too much resource to a homepage design at the expense of other key content pages will be a mistake. It may be that the most important page on your site will be the contact page or the payment page. That is not to denigrate the role of the homepage but simply to keep it in context.

Using the homepage solely as a marketing tool or as a billboard for campaigns, is to the detriment of usability, and is counter to the user centered approach that a good user experience demands.

## **Category and Landing Pages**

A category or landing page must meet the expectation the user had when they clicked the navigation item that led to it, if they came from within the website. These pages will be very common entry points to the site for many users, due to specific searches they have performed in search engines, and as such it must similarly meet those expectations. These pages, usually appearing at the second level of a website, allow users to begin to identify themselves as having a particular interest or requirement. And content will need to reflect that need or interest.

An effective landing page should put the user in control of content, for example, by providing filtering controls or more specific search mechanisms within a product category. These pages must provide effective sign posts to the content available within that section and offer a clear means to access it. As users commit to certain user journeys they reveal themselves as a particular type of user with more specific interests. Content should match those interests accordingly.

Design patterns which users may expect to find on these pages can include product or service listings, simple presentation of the options available within this section, filtering tools, if they are looking at subcategories of a product, secondary navigation, allowing them to browse or navigate laterally within that section. Just as with the homepage, business goals also apply to these pages, as they involve an organization promoting specific products or services. Facilitating business goals on

category pages can be furthered by the following techniques: grouping similar products or services, offering the right tools to narrow options available, or changing the tone of content to appeal to this more specific audience. Also, homepages, category or landing pages will rarely not be suitable for inappropriate marketing or advertising.

Let's look at a simple example. In this case, as a user, I have arrived at the men's section of an online clothing retailer. I'm immediately presented with content that is relevant to my request to see men's products. And I am now equipped with tools in the left hand column to continue making my query increasingly specific. Note the use of images here, which are highly appropriate given the subject matter. Also note the lack of other visual clutter. Products are front and center and my key tasks are facilitated.

## **Product Page and Checkout Design**

Again, taking e-commerce as our example model, the category page forms the first step on the path to conversion.

Here we have broken down these steps as follows. Firstly, finding where a user identifies the right category of product for them. Then comes selection, where the user selects an individual product. Next comes decision, where the user assesses the product based on key criteria which means their criteria. Then it moves to cart, which is a conscious decision made by the user to proceed with a purchase. And finally, checkout, where the user follows through on their purchase.

And let's look at the next step in this sequence, which is selection. Individual product pages represent the point at which most users will decide whether or not to purchase an item they are considering. User queries at this level of a website will be highly specific and informed. Failure to answer these queries may drive the user to a competitor, a behavior we will all recognize. Options offered to the user at this point should become limited and restricted either to purchase or to the retrieval of information that may lead to the purchase.

Let's look at an example of a badly rendered product page. The dominant element on this page is a paragraph of text. While as a user I can see the price, the images shown would not excite or inspire too many users. Where is the delivery information? Why is the page so oddly laid out? As you look at this page, again consider the themes of trust and credibility that we have returned to throughout this module. At product page and checkout stages, barriers to conversion are all too easily created. Common barriers to conversion can include obscure add to cart buttons, lack of visible payment options, obscuration of key information on delivery or other additional charges, poor product presentation, lack of product reviews, or forced registration in order to make a purchase.

So what should a product page look like? Here's an example product page that gets most of those elements right. The price is clearly displayed. Shipping information is also displayed adjacent to the price; in this case, it's free. A review summary in terms of number of stars is shown beside the product name. The 'add to cart' button is highly prominent on the page. Summary information is displayed with an option to reveal more if the user requires it. And the product imagery is of a high quality and there are multiple views available. All of these help to form a better view of the page by the user.

Shopping cart, or basket design, is as important as the design of any other webpage. This is not something that should be left to default settings of an e-commerce platform or package. The cart, or basket, is one of the last wait points for a user on their path to purchase, and as such, it should offer nothing but reassurance and confidence in the purchase. Components in an effective cart page can



include a summary of user selections to date, a clear call to action pointing towards checkout, the ability to alter quantity or remove the product, a full price breakdown, and a clear total cost of the purchase. On these pages, while there are any number of options the user might take, the action to proceed to checkout should be the unambiguous, primary action for the user.

The design of a checkout process can influence a conversion or purchase right up until the user has completed their order. Checkout steps correspond to the main stages in a website conversion funnel, which detail where purchases have been abandoned. Conversion funnels, built up through analytics on a series of webpages, offer valuable insights into where users have abandoned their purchase. Usability testing can supply the 'why'.

Elements which contribute to cart abandonment can include badly laid out steps or screens, poor feedback offered to the user about where they are in the checkout process, superfluous or needless screens which offer the user little or nothing, or poor user guidance around what the purchases will entail and what information they will be required to input.

## **Form Design**

Forms are something we all have to contend with on the web. Principles of good form design can increase conversion rates. These principles include minimizing the number of optional fields and explaining why certain information is required, in line validation of inputs, simply letting the user know when they have made an error, the chunking or grouping of related information, text field lengths reflecting the amount data required, and distinction between primary and secondary actions.

Form design practice, which can create friction and difficulty for the user, can include placing form fields in more than one color, using input fields inappropriate for the data they are requesting, extensive instructions, preamble, or other superfluous text, or using non-standard input mechanisms. Common form design errors include high levels of complexity, failure to prepare the user about information that will be required during the process, exposing all users to all text fields regardless of the relevance to them, the lack of feedback to the user about form progress on longer processes, or failure to inform users of errors until much later in a process forcing that user to return to a previous part of the form. Asking users for personal information in forms is not a right, and it must be earned through having clearly offered value to the user right up to that point. As mentioned, requests for superfluous information on forms is a major obstacle to conversion.

Recognize that form fields that request information for reasons other than those core to a purchase can create friction and encourage drop off. Simply explaining to the user why certain information is required can go a long way to increasing user confidence to continue with a purchase. Forms can be complex, and like our navigation systems, we should not assume that users will know how to get through a form unaided. Offering help beside particular form fields can assist the user in filling it out correctly. Help and guidance can and should be included but it must be timely. It will do no good offering users help on a form field they will encounter in three screens time. And it must be non-invasive. If help or guidance gets in the way of what the user is trying to achieve then a barrier to conversion has been created. Simple explanations of why certain information is being requested help to reassure the user about the process they are engaged in.

Finally, let's look at security. Facts around how or where people will make purchases have changed markedly in recent years. Mobile purchases are increasing exponentially and websites must accommodate this into their thinking. Most users may harbor some concerns about security when purchasing items online. However, data has emerged over time which reveals that an overemphasis on security can be counterproductive and actually create user doubts. This appears to be users



feeling that if so much is being made of the security of the website, then the site must be overcompensating for something.

Let's take a look at one site that handles the security issue in a very subtle but very effective way. In this example from the online clothing retailer we looked at earlier, the proceed button is specifically labeled pay securely now. For most users, this is reassurance enough. The page features very little other reference to security. Always bear in mind that there will be many ways to communicate what you want to users and they may be not what you expect.

