Often front-end development testing is not talked about. However, a key part of development is testing the user experience. Depending on the type of product or the stage of development, there are different evaluation methods that can and should be used. This paper describes different methods, their strengths and weaknesses. It also goes into depth on the UX Curve specifically and it’s strengths and weaknesses.

User experience deals with two types of features: pragmatic and hedonic. Pragmatic deals with functionality while hedonic deals with emotions. Both need to be measured in the testing of user experience. Because of the many types of products, and stages of development, there are numerous evaluation methods. These different evaluation methods can be qualitative or quantitative, long-term or short-term, academic or business related, and much more. While there are endless possibilities, finding the best methods to fit one’s needs is key. Often multiple methods will be needed. The UX Curve is customizable and has become a popular method. It is very versatile and user friendly. Many do not even understand the difference between user experience and usability – let alone why methods would be needed.

Often, user experience and usability can be grouped together or confused, but they are different features. User experience is composed of two different parts: pragmatic and hedonic. The pragmatic side of user experience deals with software sensibly and realistically based on practical rather than theoretical. While the hedonic side of user experience relates to pleasant sensations (Bevan). Put another way, the hedonic side deals with user experience of pleasure while the pragmatic side deals with user expectations – namely how well a product lives up to the user’s idea of functionality. Before adding the hedonic side, user experience was just usability. Now, user experience highlights the emotional aspects. The emotional aspects must be measured. User experience can be measured both during and after the use of a product (Law, Bevan, Cristou). Different types of evaluation methods are used depending on when the user experience is measured. The goal of user experience is not just to bring effectiveness, efficiency, and satisfaction but also optimal expectation, interaction and reflection. “User experience includes all the users’ emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and accomplishments that occur before, during and after use (Bevan).”

Evaluation methods are the key to user experience success. In the same way that developers build unit tests for their code, different evaluation methods are used to track software’s functionality, usability, and pleasure.

Functionality: Meaning that a product without the right functionality is useless and causes dissatisfaction. A product has to fulfill the needs of a user. Usability: When a product has the right functionality, the product has to be easy to use. A user doesn’t just expect the right functionality. They expect ease in use. Pleasure: When the user is used to usable products, they want something more. Meaning, when functionality and usability have become levels of plain ‘product hygiene’ they want products that do not just bring functional benefits but also give the user emotional benefits (Law, Bevan, Cristou p.34).

The key feature measured is pleasure. User experience must be evaluated, because user experience goes much deeper than just usability. The key difference from simply usability and user experience is that the hedonic side of evaluation is added as well as the pragmatic side of evaluation. What is being measured? There are two distinctive objectives. First, human performance must be optimized. Second, developers need to optimize user satisfaction by achieving their pragmatic and hedonic goals. In an effort to achieve those goals, methods can be categorized into three different groups (Bevan ?).

First: Methods to evaluate and design for the hedonic goals of stimulation, identification and evocation and associated emotional responses. Second: Methods to evaluate and design for the user’s perception of achievement of pragmatic goals associated with task success. Third: Methods that support the design of the user’s experience (including setting requirements and understanding the context of use) (Bevan p.).

These methods concentrate on the user’s emotions while they interact with the product. Measurements can be both objective and subjective, and there are many different types of methods that can be applied.

Because user experience is context-dependent, it cannot be tested in just one way. In order to holistically test user experience, a broad set of factors must be used when testing. Depending on what product is measured, there are different evaluation tools. There are different evaluation methods for the impact of expected user experience to purchase decisions, continuous excitement, and why/when users experience frustrations. Performing numerous and various user experience evaluations helps set a precedent for what the developers and product sellers should expect. “In the context of UX evaluation, the methods must include the experiential aspects, not just usability or market research data. Also, the methods should preferably allow repeatable and comparative studies in an iterative manner” (Roto, Vermeeren, Law p.714). All of the different means of evaluation can be found in two different categories. The first is perspective-based inspection. Perspective-based inspection is a category where participants are asked to pay attention to one specific area. The second is using the heuristic matrix in evaluation. A heuristic evaluation is a usability inspection method. It’s used in computer software to help find usability errors in the user interface design. Both of these categories define attributes that cannot be overlooked in evaluation. It’s important to make sure the product is being tested over a range of demographic groups. Grouping people by age, ethnicity, and academics is important. While evaluating, measuring breakdowns and improvements throughout development is key. Measure user experience obstacles: why and where were user’s frustrated? Measure malfunctions: how many reboots or severe technical problems were experienced? Measure usability problems: what were the top 10 usability errors that users found? (Law, Bevan, Cristou)

A study was performed with thirty different user experience evaluation methods. Out of those thirty methods, fifteen tackled emotions, value, social interaction, and brand experience. Some of the different categories for method evaluation types are as follows: lab studies with individuals, lab studies with groups, field studied (short observations), field studies (longitudinal), surveys, expert evaluations, and mixed methods (Roto, Vermeeren, Law). Lab studies are commonly needed and used during the early stages of development. In these studies, user’s expressions are monitored while they interact with the product. Often these lab studies work best with individuals rather than groups. Using lab studies in a group setting can be helpful to see a crowd reaction and how their peers can influence them. The key to using evaluation methods in real life situations is utilizing the methods over a period of time. Surveys can be a very helpful means to evaluate when feedback is needed quickly. Online surveys have been proven to be the most efficient means of obtaining helpful and timely feedback. Online surveys are also a natural extension to testing a user’s website experience (Roto, Vermeeren, Law). In the study, different evaluation methods were used based on whether the product was in the industry realm or the academic realm. When working in industry, only a few resources can be accessed. On top of that qualitative methods are preferred during the early product development stages, but for marketing the product, quantitative measures are needed. For example, in the early stages, one might use mind maps, lab studies, or a retrospective interview. During the end stages, one might use a heuristic matrix and questionnaires. On the academic side, evaluation is much more quantitative. Validity is heavily emphasized. Long-term pilot studies are often utilized (Roto, Vermeeren, Law).

The key feature of user experience is enjoyability, which can be established by creating a fun, beautiful, hands-on piece of software. “Mahlke and Thuring (2007) distinguish three user experience components which together determine the user’s overall appraisal of a system and influence their future decisions and behavior: perception of instrumental qualities, emotional reactions and perception of non-instrumental qualities. Instrumental qualities are related to the usability and usefulness of a system, while non-instrumental qualities are related to its appeal and attractiveness” (Kujala, Roto, Väänänen-Vainio-Mattila p.473) The UX Curve is an evaluation method that can be applied to a product over a period of time. Historically, the ESM (Experience Sampling Method) and DMR (Day Reconstruction Method) methods have been used in the early stages of development. ESM “was developed to collect information on people’s reported feelings in real time in natural settings during selected moments of the day.” It eliminates bias because it’s performed in real time. However, it is an inconvenient method because it interrupts the user’s day. DRM is less intrusive than ESM, because it only asks the user questions once a day. Both studies are rare though due to the expense and length of participation needed. For the most part, longitudinal, real-time measurements are expensive and often impractical. Due to this, the UX Curve has been developed and found to work well. The UX Curve is designed for a face-to-face setting so that the researcher can better inquire into the participant’s reasoning and thoughts. It investigates the attractiveness, ease of use, utility, and degree of usage. The UX Curve is mainly interested in tracking the chronological order of experiences and how that affects user’s overall evaluations and also it attempts to predict later behavior.

The UX Curve works by each user developing their own curve to show how their relationship with the product has changed over time. Afterwards, they have to give reasons for their curve. Users graph their response to four different factors: general attractiveness, ease of use, utility, and degree of usage. After the curves are drawn and reasons are given, the information/results are categorized. “In addition to drawing the curves, the users described the factors that improved their experience over time or cause it to deteriorate. The reasons were also categorized into pragmatic (utility and usability) and hedonic issues” (Kujala, Roto, Väänänen-Vainio-Mattila p.479). The UX Curve has been found to be successful at tracking user experience satisfaction throughout long periods of time by providing large amounts of helpful qualitative data. Because the curve relies on user memories, it is not an exact representation and is therefore more retrospective. The UX Curve displays the peaks and end points influenced by user experience. It also reveals ways the user experience can improve over time, and it is reasonably a cost-effective way to study long-term. Overall, it’s a great evaluation tool that incorporates multiple different evaluation methods.

CONCLUSION

Front-end development is an integral part of product building. User experience deals with not only the practical structure but also the emotional side of the product. In order to provide the best service, user experience should be tested throughout development. There are many different evaluation methods, and often a collaboration of multiple methods provides the developer with the best results. The UX Curve is a newer method in which the user creates his/her own curves for specific categories. It provides great qualitative data and has recently become a popular tool. It is important to choose specific methods that result in information needed for production. Testing is important for the front-end of development not just the back-end.