

Challenges in Streamlining User Experience Design

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ABSTRACT

As the software industry has evolved into having solutions for many of our basic needs, User Experience (UX) looks like the next big thing to invest in, especially in the enterprise world. This paper presents three development directions I consider crucial for UX design in the years to come: (1) Bringing the design inspiration process closer to designers' tools and making it more organized, (2) Further optimizing current content creation algorithms, and especially (3) Evaluating new designs with the masses, in a semi-automated fashion.

Keywords

Usability, User experience (UX), UX Design Evaluation, UX Design Optimization.

ACM Categories and Subject Descriptors

D.2.2: [Design tools and techniques]: Evolutionary Prototyping. D.2.2: [Design tools and techniques]: User Interfaces. H5.2: [User interfaces]: Screen Design. H5.2: [User interfaces]: Evaluation / Methodology.

INTRODUCTION

User Experience (UX) [24] design is a crucial part of the life of a software product, in many cases more important than the actual engineering implementation. Why? Simply because “*attention to usability dramatically decreases costs and increases productivity*”, as Brad Myers put it a few years ago [9]. In almost all cases it is much better to validate a prototyped design with a group of users, and then iterate on it, instead of validating and iterating over fully-fledged software. Thus, “*thinking like a designer can transform the way you develop products, services, processes – and even strategy*” (from Tim Brown [1]).

At the dawn of the Internet era, software designs were primarily taking a functional approach, putting most focus on how a product is (1) learned and (2) used. Thus, an application that was solving a real problem, and had characteristics such as ease of use, self-explanatory, focused, consistent, simple, etc., would have been a very likely success. In the meantime, such solutions have appeared for many of our everyday necessities, and this in my opinion has shifted the creative design industry towards bringing in a new, additional benefit to the customers: *The Experience*. Besides the two focus areas mentioned in the beginning of this paragraph, it became more and more important to add a third dimension to the creative process, namely how a product is *perceived* – to

what extent do the users get immersed into working with the application, into not switching it for another one, etc.

Investing into creating a good software design has always paid off in the past, but nowadays one has to invest in exceptional user experiences, which uphold users' perceptions about each product. This makes the creative design process more cumbersome, lengthier, and above all, costlier. In this talk I will present what I consider to be the three best evolutionary directions for the creative industry, as well as the challenges associated to them: (1) Further improving the design inspiration process, (2) Streamlining the actual content creation, and (3) Rapidly validating new creatives. While the past has given us significant investments focused on teaching designers the best practices they should use (e.g., Preece et al. [10]), as well as on improving the generic design process for a better organization and communication (e.g., Borchers [8]), I believe the next phase will be about *optimization*, about how we can make these processes easier and faster – and thus keeping the user experience design phase at similar time and monetary costs, yet also delivering the extra benefit of immersiveness into the new application experiences.

The remainder of this paper overviews each of the three research areas I consider as trends of the future, and then briefly concludes in the end.

STREAMLINING THE INSPIRATIONAL PHASE

The oldest (continuous) trend is about helping designers get over the so-called “*white page syndrome*” – kick-starting a new creation from scratch. This preoccupation started a long time ago with the appearance of image collections, initially in a printed form, and then digitalized. Getty Images [11] and iStockPhoto [12] are some very popular examples of large portals for inspiration, but they have been recently joined by many other types of initiatives, ranging from inspirational blogs such as The Dieline [13] or FFFFFound [14] and down to more narrowly targeted web sites such as Logolounge [15] or Brands of the World [16]. All this plethora of information is what makes the “*design as research*” paradigm still valid today, with various twists pertaining to individual differences (of culture, age, lifestyle, etc.) [3]. I believe that this new wave of inspirational facilities will soon need an organizing body – an application that brings all this content together, while enabling (1) high quality, very fast information retrieval, (2) many of the common creative browsing behaviors, and (3) the ability to bring creative professionals together in a social environment.

Until recently, scientific research has generally focused on streamlining the inspirational design process only for narrow industries, such as the textile industry, for which several studies, design frameworks, and best practices have been proposed [2]. With the advent of the more powerful computational resources and artificial intelligence algorithms, innovative approaches to the creative design process have started to develop.

One of most active areas for this kind of research is the advertising world, in which software applications now allow for an automatic generation of content variations. The underlying idea is simple. Creative professionals use layer based tools such as Adobe Photoshop [17] to bring to life new content. Based on this type of technology, rather than designing only one alternative for each object or scene in a creation (usually depicted as a layer), creatives are asked to deliver multiple content variations for a handful of the content layers, each of which is targeted at potentially different audience tastes. This way, although a single primary concept is created, by randomly combining all the variations associated to each content layer, literally dozens of thousands of alternatives of the same piece of art can be generated. For example, a car advertisement can be designed with 2 car view variants (say, from the front, and from the back of the car), and with 3 underlying scenery variants (say, in the mountains, at the seaside, and in the city), thus easily obtaining $2 * 3 = 6$ alternatives for the same advertisement. Further on, behavioral targeting mechanisms can be used to match each web user's preferences with the best fitting creative variation.

While this kind of technology has already been brought to the mainstream industrial life by products such as MediaMind's Smart Versioning [18] or Google's Teracent [19], I believe we still have a long way ahead of us when it comes to automated creative content generation. At a minimum, the generation of such variations should include much more automated processes, potentially starting from a single creative unit and automatically generating all the others. Yet this requires complex scene and object recognition algorithms in order to identify the semantics of the original concept, solid search and similarity tools in order to retrieve the best alternative content pieces, as well as image and video processing methods in order to correctly place the new content in the initial concept creative. Some preliminary efforts along this path do exist (such as for example the Creative Artificial Intelligence [20] project), but for now they have not made their way into the scientific research world.

STREAMLINING THE CONTENT CREATION PHASE

Once the creative professional has decided on a direction to follow, the next phase requires putting together the actual piece of art as fast and as easy as possible. This has been the primary goal of the industrial world, focusing for years on optimizing the design workflows as much as possible, thus enabling designers to spend more time creating, rather than bringing their innovations on paper (and later, on electronic media).

I believe this area can still benefit significantly from the recent applications collecting large amounts of user data,

even though this kind of data is, in the vast majority of cases, anonymous. Examples of successful initiatives of this type include *We feel fine* [21], an application showing trends in automatically determined user feelings from a plethora of online environments, split onto gender, age, location, etc., or *NetAverages* [22], an aggregation tool indicating the most used technologies at each moment, over the world wide web (e.g., browsers and browser versions, operating systems, devices, etc.), or *Kuler* [30], which lets creative professionals see the most used color palletes within its community (with several options to drill-down on geographic user locations, and a few more). Yet this is just the beginning, and there are so few initiatives allowing us to sift through this immense collection of useful data and then apply it in order to create more successful designs upfront.

Within the academic research world, Johnson et al. [6] present a great survey of computational support for design sketching, ranging from the use of symbols, to hardware and then (primarily 2D) sketch recognition tools, while also introducing the underlying principles upon which these artifacts work. Calico [5] for example is an automated sketching tool with support for rapid shifting of focus, informal low detail models, and mixed notation mechanisms. However, just as with the creative artificial intelligence, it is obvious that this kind of software is still rather primitive and until strong recognition capabilities exist, it will remain confined to a limited use.

Last, but not least, we will continue to see the evolution of mainstream design applications, both in terms of further streamlining their existing functionalities (which usually refers to transforming currently existing difficult and time consuming workflows into single-click features) and in terms of generating a great deal of brand new algorithmic innovations, such as the "content-aware refine edge" selection feature of Adobe's Photoshop [29], which reduces creative time with hours when it comes to any complex content processing, ranging from hair to trees and nature landscapes selections, etc.

STREAMLINING THE CONTENT VALIDATION PHASE

The last, the newest, and probably the fastest growing area is that of validating each new creative piece. In the past, the evaluation of new designs has very much focused on (iterative) satisfaction surveys, expert sessions and user interviews (see for example the book of Preece et. al [10] for an excellent introduction into all the phases of the design process, or the article of Bevan [28] for a good overview of the mainstream approaches to user experience design evaluation). Similarly, in IT, design moved from being rather scientific in the 1980's to more creative approaches in the recent decades, focused on "artist designers" and with a more and more pronounced tendency to prototype, iterate over creations, and validate them through user studies [4].

Because they bring in a great deal of qualitative data, these methodologies are still used and will remain important in the years to come. However, today we can reach our users much easier through the web, today we can let them work with our new creations in a matter of hours or even minutes, etc., and therefore I believe that quantitative

information will play an increasingly important role in the design validation processes of the future – allowing us to test small units or small design increments, with a large population, in a matter of minutes after finalizing work.

The most popular tools for getting rapid feedback about new creations are A/B or multi-variate testing applications such as Omniture Test and Target. Their fundamental approach is to test two or more variants of the same creative via linking each of them with user actions such as clicks and purchase events, thus being able to quickly know whether some change in your content has increased or decreased your returns. And since this type of tool has its limitations when it comes to getting to know user behaviors in detail, a hybrid solution was invented as well – Amazon’s Mechanical Turk [25]. This one is also based on validating new concepts with users, but instead of collecting implicit information such as clicks, explicit questions are posed to the testing subjects, who in exchange receive a small amount of money for each response. I believe there is more to come from this world, because both types of technologies have their own limitations: The former gathers very accurate data, but it’s exclusively quantitative, whereas the latter offers a nice mix of quantitative and qualitative information, yet it suffers from low accuracy of its data (many subjects respond instantly, inaccurately, caring more for their payment than for delivering a reasonable answer to the evaluation experiment).

More recently, two types of promising design evaluation initiatives have been developed. First, there are the technology probes [7], artifacts meant to capture the user behavior in his or her daily life, thus enabling a much richer feedback about both generic needs and specific tools. Second, even closer to the creative professional, there are the computational feedback applications, software that predicts how users will receive a new piece of content. These have been long studied in the academia, but never took off, primarily because of the naive functionality they provided. For example, WebSAT [27] allows for the automatic validation of fundamental usability and accessibility rules in a Web page design, yet it remained at the level it achieved back in 2002. At the other end, it is only now that the industry truly awakens to notice and invest in automatic design validation tools. These range from simple applications such as Adobe’s BrowserLab [23] which indicates how a new user interface design will look on multiple web browsers, and down to much more complex technologies, such as the generation of saliency maps indicating which areas of a creative will catch user’s attention more thoroughly, the calculation of aesthetics scores relating each creative to its predecessors based on a set of aesthetic rules and principles, and even the incorporation of low-cost eye tracking mechanisms into the creation tools (which allow designers to validate content perceptions on themselves). While it is clear that the algorithms for generating such design feedback can be considerably improved, I believe that the proliferation of cheaper and more powerful personal cameras, the now-common rapid increase in hardware capabilities, etc., will soon bring the creatives close to trusting such methods entirely, to closely

connecting them to the quantitative analysis tools mentioned above, and to generally making them an indispensable part of their life.

CONCLUSION

In this paper I have overviewed what I consider to be the three most important challenges of the years to come for user experience design researchers: (1) Further improving the design inspiration process, (2) Streamlining the actual content creation, and (3) Rapidly validating new creatives. Above all, I believe this is the direction needed by the industry to evolve, and I am strongly encouraging research within any of these areas.

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