

Reviewing Norman and Wright/McCarthy Concepts for a New Online Generation

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ABSTRACT

In this paper I will review and discuss the concepts outlined in Dr. Donald A. Norman's *The Design of Everyday Things Chapter 1: The Psychopathology of Everyday Things* and Wright and McCarthy's *Technology as Experience Chapter 3: a pragmatist approach to technology as experience*. Furthermore, I will take an exploratory look these concepts in the online space; their adaptability, relevance, and how they can relate to a different generations.

Author Keywords

online, usability, esthetics, Donald Norman, Peter Wright, John McCarthy, Jakob Nielsen, cognitive design, Digital Natives, Marc Prensky, HCI, John Dewey.

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INTRODUCTION

A new generation of online users are emerging—a generation that no longer sees the internet merely as a way to increase productivity [8], but rather as a focal point in their lives and a vehicle to do new and different things. “The difference (in the generations is) not so apparent in how (they) use technology, but rather how (they) feel about technology... the new generation doesn't call it technology. It's simply the 'stuff' they use everyday” [8].

There is no mistaking the presence of a new digitally immersed generation. They have been defined as the MySpace Generation (Hempel, The MySpace Generation), the new media generation (Solis, Is Twitter the CNN of the New Media Generation) and finally Digital Natives (Presky, Digital Natives, Digital Immigrants).

Prensky's definition of Digital Natives is the most in depth and recognized look at analyzing this generation. Prensky states that Digital Natives' brains are literally wired differently than their counterparts, Digital Immigrants. Digital Natives have been continually exposed to interactive technology during the “super-plasticity” years of their lives—the teenage years. The digital universe was conceived of, pioneered, and created by the Immigrant; but what will happen when Digital Natives take over the

world's information and virtual marketplace?

With human computer interaction (HCI) entering an age filled with new challenges and solutions can traditional concepts hold up to these significant sociological changes? How can designers anticipate the needs of this new generation and the generations to come? To help answer these questions I will explore the concepts outlined by Donald A. Norman and Peter Wright with John McCarthy in their books *The Design of Everyday Things* and *Technology as Experience*.

Donald Norman's chapter was chosen to explore the cognitive side of design. He touches on concepts such as visibility, affordances, constraints, mappings and conceptual models and then provides practical and sound advice for implementation. As a master of the cognitive aspects of design Norman is a prime example of applying science and reasoning to the area of design. This reading was chosen to help provide more insight to the cognitive mind of the user from a design prospective.

Wright and McCarthy's reading *Technology as Experience*, borrows concepts from many researches and philosophers who in some form or another, have discussed technology as experience in the past. Some examples include: Brenda Laurel's concepts around extending our minds via computer engagement [10]; John Dewey on an active self which shapes action [10] and the internal dynamics of experience [10]; Mikhail Bakhtin on the primacy of felt life [10], and so on.

Wright and McCarthy deliver what they describe as a three-pronged approach to embracing and then advancing the concepts mentioned above. The first, suggests a clear continuity between aesthetic and prosaic experiences. The second by developing tools to analyze aesthetic experience with technology, and finally by going beyond individual experiences to look at connections between individual experience and their history and circumstances [10].

Wright and McCarthy's reading was chosen to help provide more insight to the technological “experiences” of the Digital Immigrant and Digital Native generations.

DONALD NORMAN

Dr. Donald Norman is the founder of The Cognitive Science Society, considered an expert of cognitive science and is widely considered to be the first to apply advanced human factors to design via cognitive design (wiki). He currently co-directs the dual-degree MBA Engineering program at Northwestern University.

Norman has been identified as one of the top influential designers [5], been awarded the Benjamin Franklin Medal in 2006 [5], and has received the “Lifetime Achievement Award” from the professional organization for Computer-Human Interaction [2].

Norman often states he is not an expert in Web Usability [15]. However his repertoire has simply out-shined this modest persona. To underestimate Norman's impact on current web usability standards would be a mistake, even if his eclectic counterpart, Dr. Jakob Nielsen, often overshadows him.

In 1998, Jakob Nielsen, Donald Norman and Bruce Tognazzini founded the Nielsen/Norman Group, a consulting group on matters of usability [17]. On the companies website their philosophy is stated as: “To help companies enter the age of the consumer, designing human-centered products and services.”

While Jakob Nielsen is dubbed as the “The guru of web page usability,” [9] Norman is equally touted as “The guru of workable technology,” [11]. As we look at Norman's traditional concepts from *The Psychology of Everyday Things*, it is clear that these concepts align with current web standards of today. As mentioned above, with his clout in the usability world it is hardly surprising to see his concepts so closely weaved into the current web usability standards of today.

The Design of Everyday Things stresses the importance to design based around the needs of the users and the principles of cognitive psychology. The first issue that arises around the concepts Norman reveals in the chapter is based around relevance. Was HCI what Norman was referring to when he wrote this book? The title of the book clearly states he is writing about “everyday things”. Can we simply conclude that computers are in-fact an everyday thing?

In the chapter Norman lists some instances of what he considers everyday things: “paper clips, books, bookmarks... zippers, snaps, laces... etc. [12]; Norman also describes these objects as simple. Norman elaborates further by providing examples of more complex items that are described as a series of simple objects.

Perhaps when Norman wrote the book he might not have considered computers as everyday things, however with the rate of computer ownership in the United States reaching 76.2% in 2006 and the average American's time online being two hours per day in January 2010 [7], it seems that using a computer, and online, does now seem to fit the mold of an “everyday thing”.

Norman does connect everyday things with simple objects. It is clear the computer is not as simple as a pair of scissors or a soap dish; however one can argue that the User Interface of a computer is indeed made up of simplistic parts: mouse, desktop, browser, icons, files, web pages, etc. While his definition is a little unclear, at the very least we can say that the online experience deserves the cognitive consideration Norman suggests. His participation in the online/technology usability world is proof of this.

Perhaps the most impressive part of Norman materializes when you compare these concepts based around the cognitive aspects of design written in 1988 with current web usability standards. Reviewing his ideas on affordances, constraints, mappings and conceptual models, provides numerous similarities to today's successful user interface, (successful being determined by continual economic evolutionary pressures of eCommerce capitalism).

Let us take the example of a navigation bar on a website:

Nielsen's *10 Most Violated Homepage Design Guidelines* would also break Norman's constraint concept: “Don't include an active link to the homepage on the homepage” [1]. Norman's constraint concept would guide us towards graying-out or removing the link of the current page you are on. By containing the user from accessing the same page from the page they are on, much confusion can be eliminated and the mental picture of the sites structure can be easily maintained.

Visualization is also regularly used in web usability standards. For instance breadcrumbs help provide a visual representation of where the user is located; this is also the case with sitemaps. Sitemaps dedicate an entire page to the visualization of the information architecture (IA) of a website [14]. Breadcrumb trails [4] and sitemaps are both considered basic web usability standards.

Mapping is also another concept of Norman's that is readily found in the personal computer world. Mapping is the main concept behind using a mouse or touch screens. Keeping traditional icon visuals such as hard disks to represent save on a file or “x”'s to represent closing a window are so engraved into our brain they are now a mapped concept in all user-interfaces.

It becomes very clear that current information architecture and web usability standards are closely aligned with Norman's cognitive concepts he wrote over two decades ago.

Our interest in Norman is to help understand how his influential concepts of HCI today might affect the HCI of tomorrow. We will continue with Norman's concepts and how they might fit with HCI's future, later on.

WRIGHT AND MCCARTHY

Wright and McCarthy take Norman's concepts to a more inclusive level. They approach the understanding of a user's needs for design on what they call "experience".

To describe what Wright and McCarthy truly mean by the concept of "experience" they refer to many philosophers and researchers over the past century. Of these references a main contributor in their concept is John Dewey.

Dewey's major writing on aesthetics was *Art as Experience*, which he wrote in 1934. In *Art as Experience*, Dewey explains his theory on looking at both the physical object and life as lived and felt. It is within this relationship of experience and object that the art process is solidified and in-fact art, society and the individual are a collective network [16].

Wright and McCarthy reference Dewey's work to clarify experience with people's relationship with technology. Wright and McCarthy state that according to Dewey:

"Experience is constituted by the relationship between self and object – by concerned, feeling people acting and the materials and tools they use. The concerned person is always ready engaged and comes to every situation with personal interests and ideologies." [10]

They argue that in order to justify the wide range of influences technology has over our lives, we have to understand technology in terms of our lived and felt experiences with technology.

Wright and McCarthy's approach to understanding human computer interaction—seeing it as creative, open, and relational, part of felt experience—is a measure of the fullness of technology's potential to be more than merely functional.

The "zestful integration" or transcendent nature of the aesthetic experience, they say, is a model of what human experience with technology might become [10].

McCarthy and Wright illustrate their theoretical framework with real-world examples. In a review of an eCommerce website in a case study at the end of the book *Technology as Experience*, the authors dissect the VirginWines.com online ordering processes from an "experience" point of view. As indicated in Chapter 3, the case studies are meant to provide concrete examples of what "experience" is [10].

THE COMPLEXITY OF THE EXPERIENCE

As Wright and McCarthy argue, HCI theories, categories, and models by necessity abstract from users' lived experiences, often inadvertently losing the details that make them relevant and personal. They point out, for example, that, while we can speak of and program for an abstract category of frustration, the user's actual lived experience of frustration (for example, a bad day at work, a breakup, etc) will in many essential details differ from frustration because, for example, a software package has crashed again. These lived experiences are precisely the kinds of details that make up rich and meaningful experiences for people. While formal models can offer useful guidelines, we can be seduced into confusing formal model for lived experience.

They criticize that many statements indicate the conviction that a particular user experience can be designed, or that experience can be shaped or controlled by good design. In their opinion, consumers are not passive "cops" that relive "prefabricated" experiences. Instead, they actively complete the experience for themselves and may even turn them into completely unintended directions [3].

McCarthy and Wright make aware the fact that most HCI approaches neglect or at least underplay the role of the personal experiences that users have in interacting with information technology (or any other technology).

THE BEHAVIOUR OF THE USER

By studying the user more closely we can see a structure in the way people perform certain tasks. Norman describes this in detail, calling it the seven stages of action, and breaks it down into three major parts: goals, execution and evaluation.

"The basic idea is simple. To get something done, you have to start with some notion of what is wanted—the goal that is to be achieved. Then, you have to do something to the world, that is, take action to move yourself or manipulate someone or something. Finally, you check to see that your goal was made. So there are four different things to consider: the goal, what is done to the world, the world itself, and the check of the world. The action itself has

two major aspects: doing something and checking. Call these execution and evaluation." [12]

Norman concludes that developing systems that adapt to users behaviour will result in a positive user experience. However, one users behaviour is not always comparative to another users; moreover one users generation is completely divided between that of another.

DIGITAL NATIVES

Gord Hotchkiss' thought concepts are described as combining neurology, psychology and sociology with the goal of understanding technology in the digital marketplace. In the summer of 2009 Hotchkiss published his newest research titled *The Buyershere Project*. The study included sponsors such as Google, Business.com, and Marketo and focused around trying to get a better understanding of B2B buying habits online.

The Buyersphere project consisted of around 100 interviews all based around B2B buying habits. A major trend he noticed was something he refers to as a digital divide, the significant way different age groups think about technology. [8]

Hotchkiss leans heavily on Marc Prensky's theories of Digital Natives and Digital Immigrants. Prensky believes humans are a product of their environment similar to McCarthy and Wright's belief in humans being a product of their own "experiences". With technology's drastic advancement over the generations effecting users environments, significant difference in behaviours, beliefs and attitudes divide the generations. Hotchkiss states that the digital divide "seemed to fall sometime around 1980 [8].

The Digital Native generation is described as having grown up with technology. More specifically they have grown up with technology at a time when their brain is at the "super-plasticity" stage of development.

Hotchkiss states that "there are two degrees of plasticity in the brain: the normal day-to-day forming and reforming that gives us our ability to learn and adapt and massive reconstructing that determines who we are as people [8]. The later he defines as "super-plasticity" phases of which happens twice in our life; the first when we are around two years old and the second when we are around the age of thirteen.

During these phases our "brain is bathed in a potent soup of neuro-chemicals... massively restructuring our cortical and sub-cortical structures" [8]. The second of the two phases, during the teenage years is of particular interest with

regards to the Digital Native. It is during this phase Hotchkiss suggests, "we learn to empathize and connect with others..." [8] and "much of who we are (is) formed" [8].

To look deeper into how interactive technology might impact the Digital Native generation Hotchkiss takes a closer look at another technology-influenced generation, The TV Generation.

In the 1950's 40% of United States owned a television set, in 1960, over 80%. The 60's produced the first television generation of children who had spent the super-plasticity years of their life in front of a television [8].

Hotchkiss then ties this in with political scientist Robert Putnam's study of American society during the 1960's and so on. Putnam's findings show "a complete reversal in how we participated in society" [8]. Generally speaking he found a breakdown in traditional social bonds—less card games, dinner parties, bowling nights etc.

Putnam looked at quite a few possible causes, government, capitalism, and big business, but in the end cited "general changes in values". Hotchkiss suggests Television was the key technological influence that was largely responsible for this generational change [8].

Without a doubt the impact of the Internet on our culture far surpasses that of television. The high level of integration seeps into every aspect of our lives; from the workforce, to educational institutions, to medical diagnostics and daily communication.

The culture of Digital Natives—a culture of connectivity, of public display, of sharing, of feedback, of constant availability of global connectivity is today's generation. With the largest demographic group of internet users being 18 - 24 year-olds [13] Digital Natives will continue to frame our world; in particular, our technology online.

DISCUSSION

The role of the user is always front and centre but in a different way. In Wright and McCarthy's approach, the user is the active protagonist of the experience, who actually selects and connects the dots of the interaction system making the experience alive and felt. They make us aware of the fact that most HCI approaches neglect the roles of the personal users have while interacting with technology.

The chief difference from Norman's interface design philosophies is that user-centered design tries to optimize the user interface around how people can, want, or need to work; a user behavioral interaction is not always a predictable and logical a priority as believes Norman. Norman lacks the ability to adapt—he clashes with

McCarthy's concept because he does not include the social aspect of it—regarding convention in practice and intellectual procedure.

Can we then ascertain that Hotchkiss ties them together by believing that the users action affects the output but that the processes should be flexible enough to adapt. Design changes continuously following user interaction, even without a predefined or optimal action plan.

While reviewing the online checkout process McCarthy and Wright mention the importance of “culturally received meaning and values at the intersection of shopping, the Internet and e-shopping that influence the our expectations of what it would be like to buy wines online” [10].

Hotchkiss' belief would support Wright and McCarthy's concepts around experience. If we are significantly altering a generation's technological experiences and even when the technology becomes intertwined with our non-technical 'lived life' experiences, can we not expect this to in turn effect society and how we relate to technology?

New generations will have different beliefs around technology, however it seems following Wright and McCarthy's concepts around the experience could prepare us for some of these challenges.

When we compare Gord Hotchkiss' table describing the differences between Digital Immigrants and Digital Natives (see Figure 1), we see a clear distinction between the two generations in a number of competing characteristics.

For example, if we look at Norman's ideas around when the user is confronted with usability issues he tells us the user blames themselves [12]. However Hotchkiss tells us that while Digital Immigrants blame themselves when they have usability issues, Digital Natives blame the technology. Hotchkiss explains that digital natives set the bar higher, try advanced functionality online and if the functionality doesn't perform as expected they have little patience and “sites and applications are just supposed to work” [8].

These types of blanket online usability statements cannot apply to both generations and based on past studies naturally tend to lean heavily towards the online thought process of the Digital Immigrants.

McCarthy and Wright remind us of Dewey's warning about ignoring our users experiences in aesthetics. “The enemies of the aesthetic are 'the humdrum; slackness of loose ends submission to convention in practice and intellectual procedure’”[10]. When they reference “convention in practice” they are warning about the standards, or in this particular example, web standards. Not surprisingly they continue to criticize others who try to set convention. "Our

concern with... user experience in HCI is that business momentum may take a potentially rich idea and reduce it to design implications, methods, or features" [10].

Wright and McCarthy's key concepts, which are relevant to the Digital Native and Immigrant generations, lie in their beliefs centered around society. The weakness with McCarthy and Wright's argument is also its strength. If HCI is based on continual one-offs as everyone's life having provided different experiences then understanding HCI becomes too specialized. As a side effect very few practical suggestions on how to improve the user experience can be rationalized.

NORMAN TODAY

Around 2003, something remarkable happened in the world of HCI. Donald Norman adapted his once cognitive usability centered approach to not only include emotional aspects of design but he began to focus on it.

Norman tells us he has changed. That people used to say, “Norman is okay, but if you followed everything he said everything would be usable but it would be ugly” [6]. Now he says his new life is trying to understand what beauty is about and pretty and emotion. He states, “the new me is about making things neat and fun” [6].

He explains this new direction by describing the "fun" philippe starck juicer. This exuberant juicer proudly resides in his hallway as the instructions state to not use the juicer to make juice, as the acid will wreck the plating. But the once practical Norman does not care because it looks so pleasant.

Norman now tells us “pleasant things work better” [17]. He uses the example of walking over a beam. Put a beam on the floor and walk across it, no problem. Put that same beam between two tall buildings—major problem. The context behind the design seems to now be playing a major component in Norman's concepts. The same could be said for other decisions we make in our lives such as food. How often do we find ourselves reaching for donuts when the logical choice of a vegetable would make more sense?

It seems Norman's cognitive concepts of the past will always be relevant, as long as the practical applications continue to evolve with the context around them the same way Norman has. To him emotion is interpreting the world and cognition understands the world.

CONCLUSION

In this article, we argued that putting life as lived, sensed and experienced, at the centre of human-computer

interaction both focuses attention on the sensual and emotional and throws new light on the cognitive and intellectual aspects of people's interactions with technology. It offers an opportunity to address issues such as resistance, identity, and attachment that are not otherwise addressed in HCI.

To cater to the new online generation, HCI researchers and practitioners have been developing methods, practices and designs for the full range of human "experience". On the one hand, a variety of approaches to design, such as aesthetic, affective, and constraint that emphasize particular qualities of experience have moved to the forefront. On the other hand, a variety of approaches to understanding users and user experience, based on psychology have been developed and deployed. These developments can be viewed in terms of one of the determining commitments of HCI-'to know the user'.

Today's online generation is the future of technology. How they relate to the design of everyday things is how we as a society must approach the user experience.

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