10373 Abstracts Collection
Demarcating User Experience
Dagstuhl Seminar

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Abstract. From September 15 to 17, 2010, the Dagstuhl Seminar 10373 Demarcating User Experience was held in Schloss Dagstuhl, Leibniz Center for Informatics, Germany. The goal of the seminar was to come up with a consensus on the core concepts of user experience in a form of a User Experience White Paper, which would provide a more solid grounding for the field of user experience.

Keywords: User experience.

1. Introduction

Thirty user experience (UX) researchers and practitioners spent three days in Dagstuhl in order to bring clarity to the concept of user experience. The participants represented different perspectives to user experience from holistic to modeling approach, from real-time psychophysiological research to investigating user experience after a long period of time, and from standardization and research to consultancy work.

By 'demarcating' user experience, the organizers wanted to make the relation clearer to the neighboring concepts of usability, interaction design, consumer experience, etc. The term created a lively discussion on whether this field needs demarcation: many researchers do not want their research field to be limited, while some industry people need a sound judgment on what user experience work includes. Despite the different needs, the participants seemed to agree on the need for bringing clarity to the vague concept of user experience. The participants also identified the need for further work on clarifying the different theoretical perspectives behind the different interpretations of user experience, and their impact on user experience work both in industry and academia.

The main result of the seminar is a white paper, which aims to clarify some core concepts of user experience. As can be seen from the abstracts in this collection, it has been challenging to come up with a white paper that would serve all needs and do justice to all the different perspectives. This work was on conceptual level, so the

paper does not provide direct practical guidance for UX work. Nevertheless, thanks to the wide variety of perspectives to user experience represented, the seminar was an eye-opening experience for the participants.

This publication includes the resulted User Experience White Paper and a collection of abstracts from the seminar participants.

2. User Experience White Paper – Bringing clarity to the concept of user experience

This chapter includes the white paper, which is based on the discussions between the participants in Dagstuhl. The User Experience White Paper is also available at *http://www.allaboutux.org*.

2.1. Preface

The term 'user experience' (UX) is widely used but understood in many different ways. The multidisciplinary nature of UX has led to several definitions of and perspectives on UX, each approaching the concept from a different viewpoint. Existing definitions for user experience range from a psychological to a business perspective and from quality centric to value centric. There is no one definition that suits all perspectives. A collection of UX definitions is available at *www.allaboutux.org/ux-definitions*.

The term user experience is often used as a synonym for usability, user interface, interaction experience, interaction design, customer experience, web site appeal, emotion, 'wow effect', general experience, or as an umbrella term incorporating all or many of these concepts.

A clear description of UX would help to:

- Teach the basics of user experience
- Communicate the meaning of the term to people unfamiliar with it
- Clarify different perspectives on UX amongst UX researchers and practitioners
- Advance UX as a research field
- Ground practical UX work in commercial, industrial and government organizations

This UX White Paper describes what in discussions with UX professionals were seen as the core concepts of UX and clarifies the different perspectives on UX. The paper is prepared as a joint effort by a group of leading UX researchers and practitioners, and is freely available at *www.allaboutux.org/uxwhitepaper*.

Disclaimer. The UX White Paper is a result from discussions among the invited experts of the Demarcating User Experience seminar, so it is based on the contributors' expertise and judgment. While we acknowledge the influence of existing UX literature on our thinking, we are, unfortunately, unable to provide a comprehensive list of literature references in this white paper.

2.2. Introduction

The field of UX deals with studying, designing for and evaluating the experiences that people have through the use of (or encounter with) a system. This use takes place in a specific context, which has an impact on, or contributes to, the UX.

UX can be viewed from different perspectives: it can be seen as a phenomenon, as a field of study, or as a practice. To understand this distinction, consider the following analogy: health as a phenomenon, medicine as a field of study, and a doctor's work as a practice. Each of these views can be further detailed as follows:

UX as a phenomenon:
- Describing what UX is and what it is not
- Identifying the different types of UX
- Explaining the circumstances and consequences of UX

UX as a field of study:
- Studying the phenomenon, for example how experiences are formed or what a person experiences, expects to experience, or has experienced
- Finding the means to design systems that enable particular UXs
- Investigating and developing UX design and assessment methods

UX as a practice:
- Envisioning UX, for example, as part of a design practice
- Representing UX , for example, building a prototype to demonstrate and communicate the desired UX to others
- Evaluating UX
- Delivering designs aimed at enabling a certain UX

In this paper, we mainly focus on UX as a phenomenon and UX as a practice.

2.3. UX as a Phenomenon

The notion of experience is inherent to our existence as people. Experience in general covers everything personally encountered, undergone, or lived through. User experience differs from 'experiences in a general sense', in that it explicitly refers to the experience(s) derived from encountering[1] systems[2].

UX as a phenomenon can be described as follows:
- UX is a subset of experience as a general concept. UX is more specific, since it is related to the experiences of using a system
- UX includes encounters with systems – not only active, personal use, but also being confronted with a system in a more passive way, for example, observing someone else using a system
- UX is unique to an individual

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[1] Using, interacting with, or being confronted passively

[2] 'System' is used to denote products, services, and artifacts – separately or combined in one form or another – that a person can interact with through a user interface.

- UX is influenced by prior experiences and expectations based on those experiences
- UX is rooted in a social and cultural context

What is UX not?

- UX is not technology driven, but focuses on humans
- UX is not about just an individual using a system in isolation
- UX is not just cognitive task analysis, or seeing users as a 'human information processor'.
- UX is not the same as usability, although usability, as perceived by the user[3], is typically an aspect contributing to the overall UX
- UX design is more than user interface design
- UX differs from the broader concepts of brand/consumer/customer experience, although UX affects them and vice versa

Although 'user experience' has a narrower scope than 'experience', 'user experience' is still an umbrella term that may refer to several forms of user experience. More specific terms may help in explaining the intended perspective. We describe three different perspectives on UX that people may take when referring to UX. Note that these terms are similar to those used in experience design in general.

Experiencing

The verb 'experiencing' refers to an individual's stream of perceptions, interpretations of those perceptions, and resulting emotions during an encounter with a system. Each person may experience an encounter with a system in a different way. This view emphasizes the *individual* and *dynamic* nature of experiencing the encounter with a system.

In practice, designers focusing on experiencing usually pay attention to specific interaction events, which may have an impact on the user's emotion (e.g., in game design, scoring a goal or the appearance of a frightening character). Evaluation of experiencing could focus on how a single person experiences the encounter with a system from moment to moment (e.g., measuring emotions at various moments in time to uncover which elements in an interaction may induce which emotions).

A user experience

The noun 'user experience' refers to an encounter with a system that has a beginning and an end. It refers to an overall designation of how people have experienced (verb) a period of encountering a system. This view emphasizes the *outcome and memories of an experience* rather than its dynamic nature. It does not specifically emphasize its individual nature because 'a user experience' can refer to either an individual or a group of people encountering a system together.

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[3] Objective usability measures such as task completion time or the number of clicks and errors are not good UX measures, since they do not tell if the person perceived them as good or bad.

Typical examples of this perspective are placing the focus of UX design on a specific period of activities or tasks (e.g., visiting a web site), the narratives of games (e.g., building up suspense and having a happy end) or the outcome after using a system (e.g., having learned a dance with a dance game). Evaluation here could focus on methods that can provide an overall measure for the experience of a certain activity or system use (e.g., a retrospective questionnaire method).

Co-experience

'Co-experience', 'shared experience', and 'group experience' refer to situations in which experiences are interpreted as being situated and socially constructed. The emphasis is not only on encountering a system, but also on people constructing and at the same time *experiencing a situation together*. If these terms are used without considering the role of a specific system in the experience, then it no longer makes sense to talk about 'user experience', but more appropriately about experience in general.

When focusing on socially constructed experiences, group behavior and/or group attitude is of importance. Designing with a focus on socially constructed experiences may result in, for example, a platform system providing general constraints and affordances for multiple people to act and interact rather than focusing on the determined flow of interaction and outcome for one person. For evaluation, this could mean including indirect 'group experience' measures such as the number and nature of encounters between people.

2.4. Time Spans of User Experience

While the core of user experience will be the actual experience of usage, this does not cover all relevant UX concerns. People can have indirect experience *before* their first encounter through expectations formed from existing experience of related technologies, brand, advertisements, presentations, demonstrations, or others' opinions. Similarly, indirect experience extends *after* usage, for example, through reflection on previous usage, or through changes in people's appraisals of use.

This, and the contrasts above between 'experiencing' and 'an experience', raise the question of the appropriate time span when focusing on UX. At one extreme, we could focus solely on what someone has experienced for a very brief moment
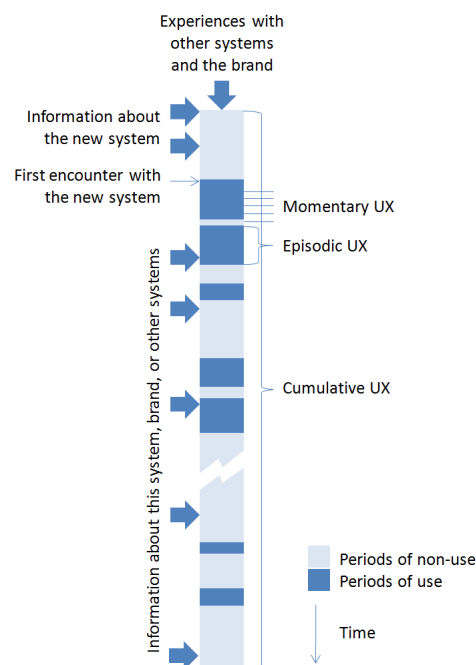

Figure 1. UX over time with periods of use and non-use

– e.g., visceral responses during usage. At the other, we could focus on cumulative experience formed through a series of usage episodes and periods of non-use, that might span months of usage, or longer. UX can thus refer to a specific change of feeling during interaction (*momentary UX)*, appraisal of a specific usage episode (*episodic UX)*, or views on a system as a whole, after having used it for a while (*cumulative UX). Anticipated UX* may relate to the period before first use, or any of the three other time spans of UX, since a person may imagine a specific moment during interaction, a usage episode, or life after taking a system into use.

When discussing or addressing UX, it is important to clarify the time span of UX that is in focus: momentary, episodic, or cumulative UX. Focusing on the moment can give information on a person's emotional responses to the details of the user interface. Focusing on longer periods may reveal the eventual impact of momentary experiences on cumulative UX. For example, the importance of a strong negative reaction during use may diminish after successful outcomes, and the reaction may be remembered differently. A focus on momentary experience places different demands on design and evaluation than a focus on usage episodes or longer time spans.

For longer time spans, it is possible to structure UX in terms of a lifecycle or journey, for example from first encounter, through episodes of usage to reflection on usage. Previous experiences influence a future one, for example, reflecting or recounting after one usage episode will frame anticipations of future ones. The phases of experiencing overlap and interleave in a variety of orders, there is no fixed sequence from anticipating to recounting.

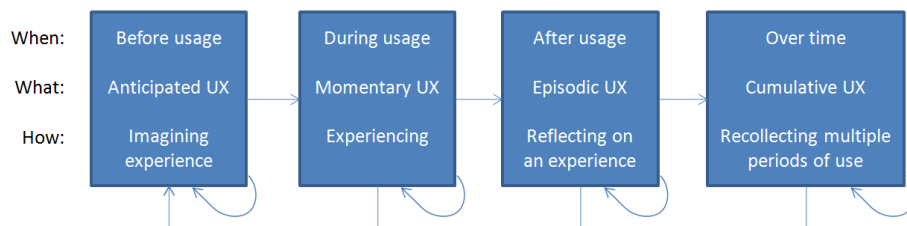| When:	Before usage	During usage	After usage	Over time
What:	Anticipated UX	Momentary UX	Episodic UX	Cumulative UX
How:	Imagining experience	Experiencing	Reflecting on an experience	Recollecting multiple periods of use

Figure 2. Time spans of user experience, the terms to describe the kind of user experience related to the spans, and the internal process taking place in the different time spans.

2.5. Factors Affecting User Experience

Although a wide range of factors may influence a person's UX with a system, the factors can be classified into three main categories: the context around the user and system, the user's state, and system properties.

1. Context: UX may change when the context changes, even if the system does not change. Context in the UX domain refers to a mix of social context (e.g. working with other people), physical context (e.g. using a product on a desk vs. in a bus on a bumpy road), task context (the surrounding tasks that also require attention), and technical and information context (e.g. connection to network services, other products).

2. User: UX is dynamic, as the person experiencing the system is dynamic. This refers to, for example, a person's motivation to use the product, their mood, current mental and physical resources, and expectations.

3. System: A user's perception of the system's properties naturally influences UX. Important for UX are the properties designed into the studied system (e.g. functionality, aesthetics, designed interactive behavior, responsiveness), the properties that the user has added or changed in the system or that are consequential of its use (e.g. the picture of your children on your phone, or scratches and a worn look after a device has been used for some time), as well as the brand or manufacturer image (e.g. sustainability, coolness).

UX itself cannot be described by describing the UX factors, but UX factors and their main categories can be used to describe the situation in which a person felt a particular UX. UX factors also help identify the reasons behind a certain experience.

2.6. UX as a Practice

The roots of user experience design (UXD) can be found in the principles of Human Centred Design (HCD[4]; ISO 13407:1999; revised by ISO 9241-210), which can be summarized as:

- Positioning the user as a central concern in the design process
- Identifying the aspects of the design that are important to the target user group
- Developing the design iteratively and inviting users' participation
- Collecting evidence of user-specific factors to assess a design

In principle, UXD is not different from HCD. However, UXD adds important dimensions to the challenge of implementing HCD in a mature form. These additions are not trivial. The main dimensions distinguishing UXD from a traditional view of HCD include UX factors; methods, tools and criteria used in UX work; representation of the UX idea; and UX positioning in the organization.

UX factors

As discussed in the previous section, the factors affecting UX are significantly broader and more diverse than those traditionally within the scope of HCD. While traditional usability factors were largely related to performance and smooth interaction, new UX factors relate to affect, interpretation and meaning. Some UX factors, such as social and aesthetic aspects, are likely to be very different in character from the traditional concerns. This presents UX practitioners with significant challenges in terms of identifying which UX factors they need to consider when embarking on a design project. In any case, it is usual that a design team will only be able to deal with a few critical UX factors that influence the suitability of the design for a typical usage situation. Consequently, a big challenge for design teams is to

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[4] Often referred to as UCD, User Centred Design

make sense of the available information during the early phases of the UXD process. Essentially this means:

- scoping out the factors that are known, because evidence exists, or are thought likely to be the drivers of UX in their particular instance,
- identifying those factors that are critical to the success of the design and can be satisfactorily dealt with by the design team, given their own operational circumstances,
- identifying those factors that are likely to need further investigation and, if so, the form that those investigations could take.

Methods, tools and criteria

All design teams face the challenge of making trade-offs between the various requirements that they have to meet. The intangible nature of UX makes it even more difficult to estimate the consequences of design decisions on the UX. It may be very difficult, if not impossible, for the design team to deal with some issues (e.g. social, emotional or aesthetic) in a very direct or explicit way. Design teams often have to handle them intuitively, relying on professional judgments.

Design teams will need to identify applicable and feasible methods, tools and criteria that can be used to manage the UX factors throughout the process. This includes setting initial targets, managing the iterative development of design proposals, and supporting evaluation work during and after the design work. In many cases the factors may involve traditional usability issues that can be handled using conventional methods.

No generally accepted overall measure of UX exists, but UX can be made assessable in many different ways. For example, there are tools for simply evaluating whether an evoked emotion is positive or negative. There are also methods and instruments specifically developed for evaluating particular UX qualities such as trust, presence, satisfaction or fun. The choice of an evaluation instrument or method depends on the experiential qualities at which the system is targeted, as well as on the purpose of the evaluation (e.g. summative or formative) and other (often pragmatic) factors such as time and financial constraints.

Representing concepts and designs

Another big challenge is to find ways of giving people a sense of what the experience might be like before the design itself is available. Of particular importance is that a design team needs to create *representations* of the system to:

- stimulate the participation of prospective users or their surrogates to gather feedback on design directions,
- enable the capture of emotional responses of people and their explanations of why,
- communicate the concepts and designs to other colleagues, senior management and others who have an interest in the success of the design,
- sustain the vision of the design team throughout the design process.

UX within organizations

UX is gradually becoming recognized and established as an important part of an organization's business and strategy. This development has consequences for the UXD practitioners, viz. new organizational debates and blurred organizational boundaries. The debates concern responsibilities for the 'customer experience issue' and the way UX fits in at different levels within an organization. In essence UX needs to have a 'departmental home'. UX needs to be much better integrated as a multidisciplinary activity into the key development processes of organizations. UX practitioners also need explicit areas of responsibility and to develop effective working relationships with the complementary functions and competences, thereby getting UX work accepted as a valued part of the overall design and development effort of an organization. In the longer term the emphasis should be on positioning UX in order to secure strategic influence over:

- the business directions in terms of new value propositions to be developed,
- the choice of designs to be developed and their contribution to the business objectives of an organization,
- the development of the processes used to guide the way the organization operates.

3. Abstracts

Due to the short duration of the seminar, we devoted the time for discussions rather than paper presentations. We did have short poster presentations, and the abstracts in this section are either excerpts from the posters or reflections of the participants after the seminar.

3.1. UX Should Not be Demarcated!

Nigel Bevan, Professional Usability Services, UK

UX as a term has more than one meaning. As an Objective it is the User's experience, and there should be no demarcation to the scope of issues encompassed within the user's experience. As a Field of Study the objective is to understand what causes the user's experience, and how to create an appropriate experience. There should be no demarcation of the scope of issues that contribute to the user's experience.

3.2. The language of experience

Marc Blythe, University of Northumbria, UK

In the Politics of Experience RD Laing argued that in order to explore "inner space" it was necessary to use the language of experience. As a psychiatrist this meant listening to patients and taking seriously the accounts of their own experience. To do this Laing transcribed long conversations with people who would more usually been sedated. Laing rejected the categorisation systems of seventies psychiatry claiming that they served primarily to alienate patients from their own experience. Laing's defence of the language of experience resonates in current HCI debates today.

3.3. Bring research and practice closer together

Elizabeth Buie, Luminanze Consulting, USA

There is a vibrant community of UX professionals who often speak of "DTDT" (defining the damn thing) and would benefit from the contributions of a mixed group of academics and practitioners in this effort. I hope that this white paper may help bring research and practice together.

3.4. To Have and to Hold from This Day Forward:
UX (Mk I) as a marriage of capabilities and judgements

Gilbert Cockton, School of Design, Northumbria University

As a chorister in my youth, I sat through many Anglican weddings where spousal promises included "to have and to hold from this day forward". Decades on, this highlights some of the dynamics of user experience (UX). An experience is something that people *have* at some time, perhaps in anticipation. What people *have* are feelings about what they are experiencing: having an experience is having all the feelings during it. Such feelings are not passive, but are instead *capabilities* of some form. People differ in their ability to respond emotionally and to be consciously aware of what they are experiencing. What endures depends on what was actually felt, and how these feelings change in a process of retrospective reflection. People thus are capable of having feelings, but they go on to *hold on* to memories, which are generally associated with *judgements* on the quality of an experience.

If we think of people as emotional processing devices, then we could see UX (Mark 1) as a process that turns usage episodes into evaluated competences and outcomes, i.e., through the process of user experience, people evaluate their own affective competences on the basis of what actually transpires. People may *have* negative experiences in the moment, but *hold* onto positive memories due to more enduring achievements. Equally, pleasant feelings during an experience may not endure as positive memories, if people reflect and realise that little was actually gained. If UX is the moment and not the memory, or vice-versa, we lose something.

The seminar at Dagstuhl aims to demarcate UX. Given the opening analysis, we should ask whether there is anything true at all that lies at the heart of UX. As it is, there is only one most true eternal fact about UX, which is, that like Sports Car, User Experience (Mk II) is *grammatically* a compound noun. This, of course, is not very helpful! More constructively, it is also true *socially* that UX (Mk III) is an evolving disciplinary focus for interaction design research and practice that focuses on narratives about both momentary and cumulative direct and indirect encounters with interactive technologies and their embracing ecosystems (people-products-services). Beyond this, UX (Mk whatever) is *whatever* it proves useful to focus on, for both or either of the humans who experience it or the researchers who study it. It's no big deal at all that stuff happens, but who cares and why? *What UX is* is less important than *why we study it and design for it*, and we can do both without placing all our faith in the fetish of a blunt dictionary definition. Are a clear definition and scope enough to help teaching, awareness, comparisons, disciplinary foundations and practice? How will our words do work in the world? We must question any blind faith in definitions.

Socially, UX (Mk II) is as UX is constructed. It is composite, complex and multi-faceted. It cannot be firmly demarcated, because we are all free to ignore any attempt at demarcation. There is no value at all in conformity within Interaction Design research and practice. If we see value in breaking the bounds of any supposedly authoritative demarcation, then we will break it, since it would be foolish to forego benefits in order to remain faithful to a definition. Grammar and lexicographic authority have little force in social settings, innit? UX cannot be demarcated uniquely

because it is not one thing. It is not a separable bounded zone of reality independent of all human choice and interpretation. This is neither the case for the users, who have experiences, nor for the researchers who research UX, nor for the designers who design for UX. This is not to say that boundaries have no value in research or practice, but these boundaries are a matter for individual choice. They cannot be handed down from experts on high. Designers in particular will always revel in breaking rules, especially when something of exceptional worth results. The last laugh would be on them.

Conceptually, UX cannot be its parts (e.g., momentary feelings), We can't promote the parts to the whole, as there must be 'parts' for there to be a whole. Grammatically, adjectives are our friends, and thus rather than demarcating the Great True UX, we should bring a range of adjectival lenses through which to research and design for UX, and thus focus on anticipated, cumulative, current, pivotal, recent, worthwhile or other specifically demarcated aspects of UX. Without such adjectival qualification, UX is close to meaningless. For example, UXs can be direct or indirect (Mk V and Mk VI), or reported, promoted, expected (Mks VII-IX), or all of these (bumper compendium UX).

So, the key question should be not what UX (Mark *one and only*) is, but why we care about it as researchers and practitioners? It is thus far better to keep on opening up the concept of UX, rather than locking it down. Each different perspective on UX opens up sets of research questions and opportunities for design practices. For example, what research questions and design opportunities arise if we see UX (Mk X) processes as multi-episode narratives of reactions, learning, interpretations, bewilderment, achievements and disappointments? Similarly, what if UX (Mk XI) accumulates, resulting in dynamic dialectics of attitudes, expectations and competences? What if UX (Mk XII) changes users, who then change their subsequent UXs? What if UX (Mk XIII) results in judgements of worth, of what can be gained, and at what cost? What if experience is both felt and gained? What if feelings are experienced, but are not in themselves experiences? What if you can never exactly experience the same UX twice? We can have many versions (Marks) of UX. Each has to prove its worth in research and practice.

I am mostly a researcher, sometimes an educator, and occasionally a practitioner. I pose questions and try to answer them. Why would I want others to pose questions for me, only to immediately provide their answers? Surely we can all pose our own questions, and explore our answers, and leave the relevant research and practitioner communities to decide on the best questions and the best answers? I therefore close with four questions that I see as essential to discussions at Dagstuhl:

1. Have we surfaced all our assumptions, e.g., is UX (Mk XIV) "actually" just an umbrella term that organises evolving concerns in HCI and Interaction Design?
2. When does UX stop and its elements start?
3. Can the causes of UXs be part of those UXs?
4. My UX must be subjective, but why should your's be?
5. Can we identify a further 14 versions of UX?

I came to Dagstuhl as a sceptic as regards demarcation. I see the current multiple perspectives on UX as appropriate to our current very embryonic understandings. We are in the very early stages of exploring UX, and we simply have no basis yet for choosing winners from the many versions of UX, some of which are little better than conjectures, while others have strong grounding in best practice. My interest in UX is as an explorer, and not a conqueror. I know that I will learn from listening to my colleagues' perspectives. For more examples of what UX could be, how this relates to older forms of task description, and how we may locate UX relative to design purpose and design details, please see my Kansei 2009 keynote via http://northumbria.academia.edu/GilbertCockton.

3.5. Positive UX By Fulfillment Of Basic Human Needs

Sarah Diefenbach, Folkwang University of Arts, Germany

(User) Experience is a complex construct and the lively discussion among participants of this Dagstuhl Seminar on "Demarcating UX" once again revealed that it will remain a challenge to find a clear-cut and at the same time unanimously shared definition (which in our view is not necessarily negative, but rather reflects the richness and private character of experiences).

One approach towards capturing the complexity of UX builds upon the basic elements of experiencing in general, such as one's momentary feelings of pleasure and pain (Kahnemann, 1999). This constant evaluative response is crucial for behavior regulation and product evaluation (e.g., Hassenzahl & Ullrich, 2007), or more general, judgments on "the entities offering that experience" – which could also be a person, a certain environment, a service and much more. Thus, UX can be regarded as a momentary, primarily evaluative feeling (good-bad) while interacting with a product or service (Hassenzahl, 2008), whereat UX as a field of research is rather concerned with the positive parts of it (e.g., Hassenzahl & Tractinsky, 2006; Hassenzahl, 2010).

A deeper insight into the basis for positive experiences and according product judgments can be achieved by an analysis of the different underlying basic human needs. The fulfillment of fundamental psychological needs such as the need for autonomy, competence, or stimulation (for more needs, see Sheldon, 2001) forms a major source for positive experiences in general and also positive experiences mediated by technology (Hassenzahl et al., 2010). Good UX thus appears as a consequence of fulfilling human needs through interacting with a product or service (Hassenzahl, 2008). In a recent empirical study we shed light on the relations between the different levels of experiential qualities (Hassenzahl et al., 2010):

Participants were asked to describe any positive experience with technology and then had to rate that experience by different measures. Starting with product interaction at the core, the next level referred to the affective outcome, which depended on perceived fulfillment of different needs. Moreover, the product's ability to satisfy needs was crucial for judgments on its hedonic quality. This means, need fulfilment will result in according characteristics

attributed to the product, e.g., based on the product's ability to satisfy one's need for popularity, it may be judged as stylish or professional, whereas its characterization as "novel" or "creative" stems from fulfilling the need for stimulation. However, this

correlation between the degree of need fulfilment and hedonic quality did only exist among those participants who saw the product as responsible for their experience. If the product was only "present", but actually didn't play a role for one's experience, positive or negative feelings were not ascribed to the product either. Thus, perceptions of hedonic quality depended on need fulfilment attributed to the product.

Though we believe that studying and designing for experiences instead of products is a promising approach, our research findings stress that this has to be done in a very sensible way. Capturing a user's experience while interacting with a product won't necessarily provide valid information on the product's specific characteristics, for example, measures of affect should not be considered as a measure of the product's quality, as the two won't match unless the user feels that the product plays a central part within this experience. The product's actual impact has to be taken into account, otherwise, designers, researchers, and finally vendors could be disappointed if a product whose use was related to positive affect in one situation won't produce the same positive feelings the next time.

Finally, a product's ability for need fulfilment and thus positive experiences is no fixed value that once assessed will remain valid, not even for one same person. The respective relevancy of needs may be changing from one situation to another, and recurring periods of product interaction are not independent from each other as well: judgments based on one situation will affect expectations regarding future experiences and, through communication about the product, will even affect future experiences of others.

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3.6. User Experience: Whose, For Whom and Why?

David Gilmore, Logitech, USA

As we try to define (in some abstract way) exactly what the term 'user experience' means, we have to first pay attention to some simple questions - whose user experience? for whom are we trying to define it? And why? The term user experience may have connotations that connect to human-computer interaction and to the design of technical artefacts (e.g. websites, software, consumer electronics, workplace systems), but the true complexity of these questions is best addressed by considering a non-technical experience - in this instance, the experience of a museum exhibit, but I could equally have chosen a movie, art gallery or piece of drama.

'Shalekhet - Fallen Leaves' is an exhibit by Menashe Kadishman at the Jewish Museum in Berlin. It consists of over 10,000 open-mouthed faces coarsely cut from heavy, circular iron plates covering the floor. A sign as you approach, but before you can see the exhibit, reads "The artist requests that you walk upon this exhibit.", which creates an intriguing anticipation and results in the fact that no two experiences of the exhibit need be alike, since my experience is affected by the presence and behavior of others.

In my case, in July 2004, I gently stepped onto the metal and cried a little inside as the metal clanged together with the sound of chains and shackles and the silent screams from the faces I was trampling on echoed around the room. At that moment, a young child ran and 'danced' on the metal, making much more noise (or music, perhaps?). Meanwhile others stood and watched, refusing to step onto the artwork, and yet others complained about the noisy child.

At least half a dozen different experiences of the same exhibit happened at that very moment – in my case two at the same time (one deeply personal and emotional and the other intellectual and slightly academic).

When we talk of 'user experience' it makes no sense to think of it as a simple thing. Whose user experience are we trying to define, design or understand? Mine? The child's? The artist's intent? The universal / aggregate? All of these have to be a valid part of the sense we make of the term 'user experience' and anyone who tries to make it more narrow is leaving something powerful behind.

And I may deliberately used an unusual and more rhetorical example here, but if I had used something more familiar (for example, the user experience of facebook) it would have been no less complicated.

3.7. Positive UX By Fulfillment Of Basic Human Needs

Marc Hassenzahl, Folkwang University of Arts, Germany

Please see the paper at
http://www.dagstuhl.de/Materials/Files/10/10373/10373.HassenzahlMarc1.Paper.pdf

3.8. UX and cross-domain fertilization

Jettie Hoonhout, Philips Research, The Netherlands

User Experience or UX for short is being mentioned in more and more publications, in particular in the HCI and in the Design domain. The discussion here is not about what UX is, what could or should fall under this umbrella name – many discussions during the seminar will be devoted to that.

The point to be made here is that UX is not solely a HCI topic, nor only a Design topic – UX will benefit from a cross-domain perspective, including several domains that might not be on everyone's radar immediately.

- One could state that UX is about meeting human motives and drivers; UX is thus linked to human motivation. Human motivation has been studied at great depth for many decades now by psychology, so, it is worthwhile to consult this body of knowledge and expertise. Fundamental know-how on motivation is in itself already useful, but also research findings in more applied domains, such as game-research are likely to provide useful insights.
- UX quite clearly has a social aspect; not only because many UX examples explicitly involve more than one person (e.g. many games, social media, many mobile applications); but also because when someone judges that something is a 'cool', fun, exciting, appealing, user experience, is almost invariably influenced by the attitudes and opinions of that person's peers. This, then, links to the domain of social psychology.
- An avalanche of methods, tools, measuring instruments, and design and development tools with reference to UX is appearing in scientific publications; some of this is of high-quality, but unfortunately many of it is not. Quite often tools and instruments are being developed in an "amateur" way; however, there is an expertise domain, psychometrics that brings decades of know-how and approaches to develop good, valid, reliable and useful tools.
- Within several domains that usually tend to be outside the immediate scope of HCI, Human Factors, Usability and Design, topics very similar to UX are being studied for sometimes quite some many years now. These domains can provide inspiration and useful insights for UX specialists. In the consumer and marketing research domain, for example, researchers are studying the hedonic aspects of consumption, product choice, and preference, beyond mere economic and utilitarian aspects.

More domains are likely to provide interesting perspectives or useful insights, so this is definitely not an exhaustive list. The list is intended as a starting point and an eye-opener.

3.9. Bodily experiences

Kristina Höök, University of Stockholm, Sweden

During the Dagstuhl event, I wanted to make a point on how experiences are rich, interesting, complex and unique. By bringing up an example of a bodily experience:

horseback riding, I showed some of the complexities of what makes up an experience. My position during the workshop was that many UX-researchers have assumed that they can "sort out" the arty, weird, magically appearing, design processes that have lead to interesting applications by applying some "scientific" rigor to the designer's process. This is where a lot of UX research goes wrong. By not studying how design really happens, the process by which alternatives are tested, dead-ends are used as decision routes, sketching as thinking, and the fact that any design will only be a local maximum in an infinite landscape of possibilities that can ever only be partly explored, they miss the point.

Sometimes you find a designer who can both do design and do research on their own process and articulate what is happening in verbal form (and not only articulated in actual design or sketching). Those design researchers provide us with insights into how the design process itself is a validation of the design. While users are brought in regularly to test their designs, the main "evidence" and hypothesis-testing happens through the exploration of design alternatives. This is where the experience is brought forth, shaped, detailed, carved out of the digital material.

The question is whether measuring the end-user experience as a few simplistic measurable variables is really helping us to do better design or to better understand the user experience. In my view, there are too many reductionists out there who harm research in this area by pretending that we can provide measurements and methods that will allow anyone to assess the UX-"value" of a designed system. If this is what will be taught at universities (to engineers, designers or HCI-students), we risk leading a lot of people into doing design as if it was a recipe that can be followed by anyone, and assessing UX as if it can only be what we can easily measure. None of those students will ever bring out innovative design or design that respects people as autonomous, expressive, creative, fun people that deserve designs that treat them as co-workers - not specimen that can be studied in a lab.

This does not mean that there should not be rigor in our studies in this area, but rigor of a different kind. Instead of reductionist models putting UX into a few variables, we should study the overall complexities of design processes and experiences users may have. This will render better design methods, better understandings of applications and ultimate better experiences for end users.

3.10. Three points about User Experience

Evangelos Karapanos, Eindhoven University of Technology, The Netherlands

User experience should not be only about use.

We seem to undermine what is happening to computing. Interactions with computing systems become subtle, part of natural human activities, such as walking in a city, participating in conversations. Usability and joy derived from interaction will eventually blur out. Instead, we should strive to understand in what ways computing can support human experiences.

We should be inquiring into prolonged use

HCI and UX consequently has focused on initial use. But there are a number of trends that ask our attention for prolonged use. First, products are increasing becoming service-center, with revenues rooted more in the services than in the actual product. Second, length and coverage of product warranties increase. Soft reliability project: "48% of all returned products, are technically fully functional, i.e. according to specifications"

Memories are (sometimes) more relevant than experiences

Literature in Psychology suggests that experiences can only be measured at the time of their occurrence. Once they have ended, experiential information does not exist; it can only be reconstructed from recalled contextual cues. But memories are not necessarily a source of bias. They are just a different source of information. Often, memories are more relevant than experiences, for example when evaluating our past or predicting our future.

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3.11. UX – What for?

Jofish Kaye, Nokia Research Center, USA

Let's not get hung up on trying to define some abstract notion of what UX is or isn't. We have two opposing views of what constitutes an experience in the room: people who believe that you've got to simplify it down to something meaningful, and people who believe you've got to make it complex enough to be something meaningful. Instead, let's focus on what UX is actually for.

3.12. Let's take the longer view on experience

Kyle Kilbourn, University of Southern Denmark, Denmark

To consider the temporal dimension of experience on a longer time span is to think not only of "an experience" or everyday experience but looking at what is gained over time through a practice of enskilment. In the intertwining of action and perception, body movements, growth and learning goes hand and hand with meaning, aesthetics and attention to explore the role of skilled practices.

3.13. Creating common ground

Joke Kort, TNO Information and Communication Technology, the Netherlands

User eXperience (UX) has many different meanings viewed from different perspectives. Each perspective emphasizing specific elements and thereby neglects others which is common for a developing area of interest. Demarcating UX is meant to find and formulate common ground, as well as to observe and understand the differences in perspectives. Each perspective has its own strengths and weaknesses in different contexts. UX viewed from a design perspective for example strives to realize different goals compared to UX viewed from an evaluation perspective. Being able to realize there are strengths and weaknesses to one´s own perspective opens up opportunities to learn, borrow and apply great ideas, methods, theories and the like from others to really develop one's own perspective and work towards a shared common ground. The 'Demarcating UX seminar' can be viewed as one of the steps in bringing this shared common ground to the next level.

3.14. User experience: the third step in making enterprise software better

Marek Kowalkiewicz, SAP, Australia

The world of enterprise software has addressed the issues of usefulness and usability very well. Enterprise software is very useful - if it was not, we would not be seeing enterprise software companies among the largest in the world. Arguably, usability of enterprise software is very high as well. Occasional users may disagree - the user interfaces seem clunky and old. But users working with enterprise software on a daily basis are quite satisfied with the usability, as many studies have confirmed.

However, usefulness and usability are not all it takes to keep the users from switching to other enterprise applications. With the rise of on-demand applications, it is now easier than ever to switch to a competitor's enterprise application. One important way of increasing loyalty of the customers is to increase their satisfaction with the enterprise software, and that is where we see user experience as an important ingredient.

While usefulness has been focusing on "getting the work done", and usability on "getting the work done efficiently", user experience should tap into completely new areas - pleasing the users aesthetically, and focusing on the affective qualities of enterprise software. One could say it is "getting the work done efficiently and with pleasure", although "pleasure" is not always the best term. It is not a coincidence, that enterprise software vendors carefully study such trends as "gamification" or try to understand the success of social networking applications. These are great examples of positive user experience. And these, in brief, can provide a yardstick for enterprise software vendors trying to improve user experience of their offerings.

3.15. Personal Comments on the White Paper

Masaaki Kurosu, Open University of Japan, Japan

What is the target?

In the White Paper, the term "system" is used (see the footnote on P.6). But this word means "*1. an assemblage or combination of things or parts forming a complex or unitary whole" (Random House Webster)*. If we adopt that word, how our experience with a single object such as a pencil or a hamburger could be described. Instead, the word "artifact" has a meaning *"1. any object made by human beings, esp. with a view to subsequent use" (ibid)*. Hence I think "artifact" is generic and can be applied to an object or a set of objects and is better to be used in the white paper.

   In addition to that, I don't think "object" is the best word to describe the artifact. In Japanese language, there are two words; one is "mono" meaning an object and another is "koto" meaning an event or a fact or an affair that are frequently used in combination with contrast. And I claim that we should use the word "artifact" to mean not only "mono" but also "koto".

User experience as a function

User experience is a function of various quality traits, i.e. it is a dependent variable and the quality traits are the independent variables. Quality traits include the usability and other pragmatic traits as well as the hedonic traits. By assuming this function, we can say that the efforts to improve the quality such as the usability are not enough. It resembles the situation where the well-written love letter may not result in a happy ending. This function is not a simple summative one hence, for example, the lack of usability may not be covered by the aesthetic design.

Three types of experiencing

I am differentiating GOB, POB and SOB where GOB stands for Goal Oriented Behavior, POB for Process Oriented Behavior and SOB for State Oriented Behavior. GOB includes operations of devices or something such as the reservation of a TV program by using a remote controller and is usually a target of usability engineering. POB has a goal but more important is the process towards the goal. A typical example is playing games and listening to the music. There is always an end (goal) but the efficiency is not important here. SOB doesn't have a goal but is just important to keep the current state as long as possible. Examples include lying oneself on a comfortable bed and sitting on an armchair by contemplating something.

   It is important to differentiate the value vector applied to these 3 kinds of experiences. As was pointed out, the efficiency is important for GOB but not for POB and SOB. The difficulty should be avoided for GOB but is sometimes important for POB (playing a game). And so on.

Time span of user experience

The white paper (chapter 3) is well written to include "the experience with other systems and the brand" and "the information about the new system". But I would

propose to differentiate 4 phases including (1) Expectancy, (2) Instantaneous Impression, (3) Evaluation and (4) Memorized Impression.

Expectancy is formed from the memory of prior experience with other artifacts and the artifact image (corresponding to the system image of Norman, D.A.) consisting of various information sources including pamphlet, catalogue, TV commercial, magazine article, various websites, short talks with friends, etc. Besides, there are two types of expectancies: the subjective expectancy and the objective expectancy. Example of the former is "that DVD recorder will surely enrich my video life" where the latter is "that DVD recorder might be a bit difficult to operate". This difference might be called the hedonic expectancy and the pragmatic expectancy respectively. Instantaneous impression is experienced when we first looked or touched the artifact and will last for a certain period (hours or days depending on the type of artifact). Usually, it is a positive experience due to the pleasure of obtaining the artifact (but sometimes will not last long).

Evaluation is experienced along with the long term usage of the artifact in the real situation. As is described in the white paper, it is a mixture of periods of use and non-use. ISO9241-210 emphasizes the importance of long term monitoring after 6 months to a year and the Users Award system in Sweden checks the UX after 9 months from the initial use. Frequently, the user realizes the discrepancies between the expectancy and the reality. But it is not always downward. Sometimes, users may find a new function that they didn't notice at the first hand. And in some cases, users can maintain the pleasure of experiencing that artifact for a long time.

Memorized impression is stored information in the long term memory about the artifact after having abolished using certain artifact. As is well known, the information in the LTM may vary or distorted. But it may play an important role in searching for a new artifact that has a similar functionality.

Positive experience vs. non-negative experience

As Desmet and Hassenzahl describes, there are the "problem-driven approach" and the "possibility-driven approach" of which I've used the term the "non-negatively directed design" and the "positively directed design". It is interesting that usability engineering people tend to focus on the former while the designers focus on the latter. It is true that "Health is a state of complete positive physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO from Desmet and Hassenzahl). But we should not focus only on the positive aspects but should not forget about the non-negative aspects. In Japan, Kano (1984) differentiated the "must-be quality" and the "attractive quality" where the former MUST BE achieved at the same time when the latter is implemented. It doesn't mean that the design must start from just the problem solving (especially for problems found in previous versions). Ideally, both approaches should be integrated, but in reality it is rarely accomplished due to the psychological nature of usability engineering people and designers. It's a very difficult issue to solve.

3.16. Why UX theories have no role at Dagstuhl?

Kari Kuutti, University of Oulu, Finland

In the Dagstuhl seminar the development of core concepts is expected to take place inductively, based on the empirical material which will be the opinions of the participants. This is naturally a fully legitimate way of developing a consensus on the use of a term. But is this consolidation of personal, practice-grounded opinions really the only way to define what user experience means. Has the more theoretically oriented research on human experience this far been so poor and the models developed so bad, that nothing can be learnt from them? And is there a real reason not to look towards any existing research and other background theories and models beyond HCI?

Based on Toulmin's example in Foresight and Understanding (Toulmin 1961) we can talk about a tension between empirists ("Babylonians") - interested in usefulness and prediction vs. theorists ("Ionians") - interested in explanation and understanding. The seminar is currently leaning towards a Babylonian perspective, but it might be useful to complement that with a Ionian one, just like also Toulmin is suggesting in his classic book. Empirical data is blind without a theory, but any theory without connection to empirical data is vacuous. It is possible to define terms and even standards by consensus - but not scientific concepts which should have some theoretical content. It may well be that what we now call UX is many; a conglomerate of different issues appearing in different combinations. If so, any attempt to find common patterns is futile. How do we know? Only by trusting some (tentative) theory. Theory and data go hand in hand: only way to develop a theory is to test it against data. We already have UX theories - why not to test them against what we know? We might step by step approach a predictive and explanatory ("Ptolemaioan") view on UX...

Reference

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3.17. User experience design challenges

Ian McClelland, an independent consultant, UK

As a long standing practitioner in the field of designing things and systems for people to use my time has spanned the transitions from the 'application of ergonomics', the evolution of 'usability engineering' and now 'User Experience Design', UXD. One of the main questions that has persisted as a core concern is: what is the most effective way of aligning human centred design work with the workings of organisations responsible for creating and delivering satisfactory designs to the user communities of interest to them? The answers are not simple and will depend on the particular circumstances within each organisation. However there are particular challenges that seem to face most practitioners working within, or with, organisations that need to be addressed if practitioners are to be effective.

1. Identify the Key UX drivers
   - Drivers are layered between the 'micro' and the 'macro' levels of design.
     - Interaction and System levels are (usually) the main focus for design.
     - Organisational and Context levels are (usually) givens but tend to be a source of significant influence over the suitability of the design.
   - Clearly identify the UX features
     - that are critical to the success of the proposition
     - that 'your design work' can influence
2. Make connections & deliver value
   - Identify how the 'UX work' contributes to the design team delivering value & a successful proposition
     - to the users and customers (people and client organisations).
     - towards the effectiveness of the organisation for which the design work is carried out.
3. Secure responsibility & influence
   - Establish a recognisable 'UX home' within your organisation that ensures the necessary managerial connections are in place.
   - Establish a position that allows 'UXD' to exercise influence over
     - The choices made by your organisation in terms of business and product directions
     - The key business and product creation processes that govern how design development is managed.
   - Core skills: determine those required to deliver 'tangible' solutions and establish (and maintain) effective links with complementary functions on the basis of mutual benefit.

3.18. Intensity, Mindset and Time

Ingrid Mulder, ID-StudioLab, Delft University of Technology & Rotterdam University of Applied Sciences, The Netherlands

Having my own experience more in designing for experiences (the phenomenon) than in focusing on user experience in which a single user uses a single product, regarding UX I often refer to three distinguishing qualities describing the process of interaction of users with 'products'. These are intensity, mindset and time.

An intense experience

We are not in a constant state of excitement, anxiety or boredom. It means that the intensity of our experiences differs. These two states can be referred to as cold and hot experiences, in which cold experience means 'just' perceiving of or participating in events, and hot experience refers to a strong emotional involvement in the perception of or participating in events. In contrast to the English vocabulary, many languages have different words to denote this difference in intensity, like the Dutch words: 'ervaren' as different from 'beleven', and the German words 'Erfahrung' as different from 'Erlebnis'.

Mindset

Another evident property of experiences is the fact that we can be taken by surprise, be swept away, hear ourselves say 'wow', or notice the goose bumps on our skin. Many emotional experiences have these very noticeable (bodily) sensations like freezing out of fear, shaking like a leaf, having butterflies in the stomach. On the other hand we can also contemplate on our experience, which in itself creates a new experience. For example, a common strategy to threat panic disorder successfully is providing an explanation to the patient for an otherwise inexplicable panic response.

Experience takes time

A third discriminating aspect of experience is the time it takes. This can be looked upon in two ways. One-way is to look at experience as having a certain development 'curve' in time: it builds up, peaks and then 'fades'. As stated by Koskinen and Battarbee: "the relationship with a product develops over time", and "there is a temporal rim around an experience" with pre-experience and post-experience. An interesting example in this case is the peak-end phenomenon as researched by Daniel Kahneman: the phenomenon in which for instance the pain experienced during a surgical intervention is best ended not by ending the inflicting pain as soon as possible but by slowly decreasing the inconvenient painful actions. Objectively this is extending unnecessary pain but it is experienced as less stressful. Memories and expectations influence the present experience.

   Participating in the Dagstuhl seminar on Demarcating User Experience reminded my how many things are implicit in the UX domain. Without saying whether the field should emphasize the *search for an UX theory* or *Designing User Experiences* it was valuable to hear and see the different perspectives. I was happy being among other peer-UX-experts sharpening this ongoing debate.

3.19. How to design for experience?

Marco Rozendaal, Symbiont experience driven innovation, The Netherlands

The question relevant for design practise is *how to design for experience*? How can experience be used as 'material' for design and how is experience assessed during the design process? Four design competencies are of importance; (1) the ability to map-out the rich and dynamic contexts from which experiences arise; (2) awareness of the coupling between body and subjective experience; (3) the ability to verbalise and materialise experiences and emotions; and lastly (4) the ability to relate experience to value.

   I believe the insights generated at Dagstuhl will help us to explore better approaches and techniques that will help designers craft new experiences and societal value.

3.20.

Noam Tractinsky, Ben-Gurion University of the Negev, Israel

The user experience is the ongoing feelings and thoughts of a person that result from the person's encounters with an interactive product in a certain context. The experience can change as time progresses and as (possible) anticipation is followed by actual interaction, which in turn is followed by memory and reflection. Past experiences can also affect anticipated and concurrent experience. I am mostly interested in applying scientific methods to the study of these experiences. The UX, is a complex construct and should be treated as such when incorporated into scientific models. In addition to theorizing about the UX, it is necessary to develop measures and measurement instruments to test and improve our UX theories. Such theories should eventually help in designing interactive systems for various experiences, in various contexts and for various people. Finally, I suggest that the term "user experience" communicates limited and imprecise (if not degrading) meaning. The term "interactive experience" (IX) may better suit this field of practice and study.

3.21. Design principles and techniques for delightful user experience

Kaisa Väänänen-Vainio-Mattila, Tampere University of Technology, Finland

A multitude of theoretical models exist for user experience, and there starts to be a rather good understanding of what kind of generic experiences people may have with interactive systems - stimulation, self-expression, relatedness, and so on. However, we as the research and development community still do not have very good understanding of how to design for specific types of user experiences. For a specific product or system, designers should be able to define the "target experiences" that the product is assumed to evoke in users. As researchers and designers we need to develop principles and techniques for such experience design process - with the understanding that we can never fully know what kind of experience the product will eventually evoke in the target users. Still, such design visions and associated techniques are needed so that the design team - or more broadly the product development team - can aim at common experiential goals and produce successful products.

3.22. A cognitive-experiential model of human-computer interaction

Paul van Schaik, Teesside University, UK

Cognitive and experiential factors in human-computer interaction have been the focus of significant recent attention, but there is a lack of a much needed integrated approach to these issues. In my presentation at Dagstuhl Seminar 10373, I proposed such an approach and applied this combined with Finneran and Zhang's (2003) person-task-artefact model to the modelling of web navigation. In the model, interaction involves three interaction components (person, artefact and task); the quality of the interaction is captured in the form of two broad categories of interaction

indicators (interaction experience and cognitive performance); a final result of the interaction is task outcome. Interaction experience is a mediator of the effect of interaction components on cognitive performance, and cognitive performance is a mediator of the effect of interaction experience on task outcome. The results of an experiment in the domain of web navigation, as an example only, confirmed these mediated effects. The findings demonstrate the need for taking an integrated cognitive-experiential approach in the modelling of human-computer interaction. More generally, inspired by Martin Seligman's ideas, I recommend the application of the science of positive psychology as a basis for improving people's experience of using artefacts and designed environments. An implication for Dagstuhl Seminar 10373 is that it would be dangerous to focus on experience without considering how it influences and is influences by cognitive performance, with implications for outcomes of product use. Therefore, future research should explore how experiential processes and cognitive processes interact and how they influence (more) tangible outcomes such as productivity and acceptance.

Reference

Finneran, C., & Zhang, P. (2003). A Person-Artefact-Task (PAT) model of flow antecedents in computer-mediated environments. *International Journal of Human-Computer Studies*, *59*, 475-496

3.23. Is the social experience part of the user experience? (Or is it the other way around?)

Arnold Vermeeren, Delft University of Technology, The Netherlands

The relationship between social experience and user experience is used here as an example.

In their job, product designers can decide on their own 'truth': a demarcation that fits their needs.

So can developmental psychologists.

However, we in the seminar are trying to come up with some demarcation for general use.

Therefore, we shall have to leave many things open and we should refrain from demarcations that are based on comparing UX to related constructs like usability and social experience...

... but then again for a demarcation we need to say something.

The challenge for the seminar is to come up with the essentials of user experience. *Nothing more, nothing less.*