The Elephant in the Conference Room: Let's Talk About Experience Terminology

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Abstract

The ambiguity and misunderstanding of disciplines related to User Experience (UX) is very much the elephant in the conference room; it is difficult and even embarrassing for many to admit their confusion on the matter. This lack of clarity has consequences, some more practical and perceptible (such as having to describe what you mean by 'UX'), but others more crucial, in the form of missed opportunities for collaboration and progress. It's imperative for the development and success of the field that we begin to question the existence and nature of this ambiguity, as well as its impact on the field as a whole.

Author Keywords

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ACM Classification Keywords

K.2 History of computing: People, Theory
K.4.0 Computers and society: General

Introduction

What do we really mean when we talk about User Experience (UX) or Experience Design (XD)? What about Interaction Design (IxD) or Human Computer

Interaction (HCI)? The confusion of such disciplines is very much the elephant in the conference room; it is difficult and even embarrassing for many to admit they cannot clearly describe each discipline or how they relate to one another. Moreover, we do not really have a shared idea of what brings all these disciplines together. This lack of clarity has consequences - it promotes communication problems, obscures opportunities for collaboration, and deprives us of the explicit vocabulary necessary to articulate new ideas as a community. It is imperative for the development and success of the field that we begin to question the existence and nature of this ambiguity, as well as its impact on the field as a whole.

How do we begin to talk about our field - does such a concept really exist? Is there a way to describe it as a composite of disciplines, and of defining these in clear ways? To answer these questions, we chose to focus on disciplines that are currently popular within the community, and are often described as being related to one another: Human Factors & Ergonomics (HFE), Usability, Human Computer Interaction (HCI), Interaction Design (IxD), User Experience (UX) and Experience Design (XD).

Others have previously dealt with trying to conceptualize the field as a fusion of related disciplines. In particular, much of the discussion has focused on UX, a concept originally developed to "capture the entire gamut of activities"[*]. Nonetheless, there has been significant disagreement on the meaning and scope of UX. Although it was first coined in 1995 [13], 12 years after its inception a workshop called "Towards

a UX Manifesto" was organized, asking participants to identify principles, policies and plans for defining, positioning, teaching and implementing UX [6]. The workshop included papers that dealt with the scope of experience, and differences between Usability and UX. Not long after, in 2009, another effort in defining UX took the form of a survey and consequent analysis [7]. Recently, Alice Gross and Sara Bongartz stated that "there is no consensus on a unified definition of the concept" [3]. The lack of agreement is a cause for concern; in 2007 Russell Beauregard and Philip Corriveau stated that "variations in its conceptualization can make (UX) design objectives unclear." Similarly, there is great difficulty in clearly defining individual disciplines within the field. Even Bill Moggridge, who along with Bill Verplank first coined IxD, describes both a narrow and broad definition of IxD in his book, Designing Interactions [11]. Moreover, Terry Winograd described in his essay "Discovering America" (from "HCI Remixed") that "HCI has been shaped by an ongoing tension between designers and programmers" and that "there has been a persistent struggle over whose concerns should drive the process," [18] suggesting that the concept of HCI is a contentious topic.

It's evident from these examples that there is still a need to understand the complex weave that makes up our field, refining the definition of each discipline as well as how they relate to one another and fit within the field as a whole.

We became interested in this issue, and through our research we identified three main areas of analysis that directly contribute to the problem: the interdisciplinary and complex history of the field, the lack of educational

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[*] Quote from our correspondence with Donald Norman.

programs dedicated to the discipline, and the nature of job descriptions, requisitions and titles. To provide a more in-depth perspective, we conducted a survey with 79 researchers and practitioners from academia and industry who, when tasked with defining the disciplines and providing confidence values for the definitions, gave us ambiguous, conflicting and at times critical feedback questioning the very existence of some of the included terminology. Moreover, we also sought the advice of experts such as Donald Norman, who shared a similar awareness of the problem: "In the end, a name is not a name is not a name. It's a mess, and I know of no way to fix it."

This paper describes our research efforts towards opening up what we feel is a long overdue conversation and discussion, raising an important question: are we using the right terminology to describe our field and its included disciplines? Further, can the way we name educational programs and job descriptions be improved? Can we draw on the history of the field to better understand the current state of its included disciplines, further helping practitioners to agree on terminology?

Historical Context
The confusing nature of the field is partly due to its interdisciplinary history, which grew stronger as technology became more and more focused on experience. Beginning with the Industrial Revolution in the 1750s, technology capabilities grew from being able to create physical and mechanical products (e.g., the steam engine or Ford's Model T) to digital, connected devices, applications and services (e.g., smartphones, tablets, social networking sites, wearable computing, etc.). With the ability to develop increasingly complex technologies came a shift in focus from more concrete, functional aspects of product design to more abstract, experiential phenomena. This is evident when noting the emerging popularity of relevant schools of thought over time: ergonomics in the 1850s, Human Factors in the 1940s, Usability during the late 1940s, Interaction Design in the 1980s, User Experience in 1995 and more recently, Experience Design. This historical trend is echoed in what Marc Hassenzahl describes as the shift from a materialistic to a post-materialistic society [1], which contextualizes the idea that "once technology becomes mature, it recedes into the background, supportive of the total experience it provides" [2].

As the total experience delivered became increasingly more important, the problem domain grew in scope; this encouraged traditionally distinct disciplines to work together to solve more holistic problems. For example, prior to 1914 the field of Human Factors focused on physical aspects of human efficiency, such as studies based on molecular hand, arm and leg movements [10]. The beginning of WWI marked the development of more sophisticated machinery such as tanks, and later, aircraft. These more complex technologies were cognitively more demanding, and caused HF to turn to psychology to account for behavioral elements such as intelligence and attention levels. This shift is the reason HF is currently known as HFE and as a behavioral discipline, thus blurring the boundaries between ergonomics and behavioral science. Another more recent example of discipline blending is the adaptation of graphic design to web design. While these disciplines share the aspect of visual design, traditional graphic design is practiced on print media which holds its own set of concerns, such as texture, canvas size variations, etc. Nonetheless, while web design is "emerging as its

own discipline with its own practices and its own set of problems" [12], there is an abundance of graphic designers currently working as web designers.

These examples illustrate the natural way in which disciplines have adapted and merged together; nevertheless, they often simultaneously remain distinct in many aspects (e.g., the case of graphic and web design). As disciplines adapt to advances in technology and broaden their scope towards more experiential concerns, it's necessary that we become aware of their correlations and distinctions in order to appropriately understand and distinguish them.

Educational System

Part of the medley of terminology also stems from the interdisciplinary backgrounds of those in the community, who have created their career paths often without direct connection to an educational program. As Fred Sampson pointed out, "there's seemingly no end to the titles, roles and disciplines available to someone interested in pursuing such careers: information architect, web developer, interaction designer, graphic artist, information developer, human factors, UCD, user experience designer, and so on." In addition, the HCI educational page (a collection for students and educators interested in HCI) shows at least 30 different names for their programs ranging from broad lab names such as "Human Oriented Technology Lab" at Carleton University to the very specific "Analysis Design and Validation of Interactive Safety-critical and Error-tolerant Systems Lab" at York University. This range of options contributes to the diffusion of the discipline's identity and perhaps also creates the opportunity to question the requirement of a formal education in the first place since it is very difficult for someone who

would like to get an education in the field to make a decision as to where to start. The departments at universities hosting the degrees are also up for discussion; should they be rooted in industrial design, social sciences, computer science, engineering, or liberal arts departments? In 2006 a group of panelists at CHI argued that the emergence of i-schools (schools of information, informatics, information studies, and information sciences) were the "new academic home for university programs in HCI that create a facilitative environment for research and academic programs" [4]. This seems like a promising path to follow but it is unclear if these programs are shifting quickly enough to accommodate the requirements of the fast pace nature of the field or if they are creating a bigger gap among industry and academia.

Job Descriptions

Directly related to the educational system is the perplexing nature of existing job requisitions. Most likely due to recent widespread adoption of related disciplines in industry (and therefore lacking a clear understanding of each) these "job reqs" are written rather ambitiously, and describe a very wide breadth of skills required of one applicant, from the ability to conduct user studies to programming and even graphic design. This skewed perception of the field's disciplines is echoed in Lynn's essay ("HCI Remixed")[2], when describing related issues in User-Centered Design (UCD): "the UCD professional is required to do too much, from collecting user data to generating design concepts to delivering specifications, to being a project manager responsible for the design process, to being a UCD 'evangelist' arguing for the very existence of their role." Moreover, the titles of advertised positions are usually an amalgam of several disciplines (e.g., "UX/UI

Survey Questions (1/2)	
1	Age range
2	Gender
3	Country of residence
4	Highest attained degree
5	Title
6	Type of work
7	Explain your position as you usually do
8	Explain your position in simple words
7	Seniority
8	Experience (years)
9	Team size
10	Role within team
11	Role activities
12	Shared role / activities
13	Team background
14	Which term describes own background the best?
15	Which term describes current position the best?
16	Fields of people within the team

Table 1. Demographics, education and work related questions addressed in the questionnaire.

Engineer"). It is imperative to understand that such job requisitions have a strong impact on aspiring applicants, who often shape their education and professional title to match the skills and descriptions listed. Naturally, the nature of such job requisitions later translates into job and professional titles, creating further confusion as to who does what.

Survey

The survey was administered through an online questionnaire that was made available for one month. During this period, we contacted professionals and academics working in the field to participate in the survey. In total, we collected 77 responses.

The questionnaire consisted of 3 parts: demographics, inquiring participant's background (including education and professional experience), questions inquiring about work methods, and questions asking participants to provide their own definition of various terms: UX, IXD, HCI, HCC, HFE, Ergonomics, Usability and XD. All questions were open - we avoided giving predefined choices, as this would very likely introduce bias. For each definition given the participants were asked to indicate on a Likert scale (1-7) how certain they were that the definition they gave was accurate.

The list of questions in the survey is presented in table 1 and table 2.

Demographics
Out of 77 respondents, 27 were female, 49 were male and 1 unspecified, and on average they belonged to 30-35 age group. The respondents were from Australia (1), Belgium (3), Canada (1), Denmark (2), Italy (1),

Netherlands (14), Russia (1), Singapore (1), Sweden (5), UK (1), USA (44), and undisclosed (3).

Education and Occupation
The respondents had on average 10 years of experience in the field. The majority, 56, had experience in industry, while 4 had purely academic experience, and 16 mixed industrial and academic experience. About one half of respondents indicated that their current position level is senior (34), while the other half was made up of experienced (26) and junior (15) positions, and 2 respondents chose not to indicate their position level.

Further, the median size of the team that respondents currently work in consists of 3-5 persons. Half of the respondents (36) indicated that there are no other persons in the team that share their role, while the other half indicated that they share their role with one (30) or multiple (11) people within the team.

We performed regression analysis to see if the education that the respondents followed is a predictor for their current job position, but no significant results were found.

Definitions
The philosopher John Locke pointed out that human knowledge is often slowed down by the use of words without fixed signification [9]. In particular, he attributes this problem to three sorts of disputes: genuine disputes (where parties have a clear understanding of the meaning of words, but disagree on the meaning of some specific proposition), verbal disputes (where impreciseness of meaning arises from ambiguity of language), or a combination of the two.

	Survey Questions (2/2)
1	UX definition + certainty
2	HCI definition + certainty
3	IxD definition + certainty
4	HFE definition + certainty
5	HCC definition + certainty
6	UCD definition + certainty
7	Ergonomics definition + certainty
8	Usability definition + certainty
9	XD definition + certainty

Table 2. The terms that respondents defined in the questionnaire.

By looking into the definitions provided by respondents we aim to investigate the depth of the verbal dispute in the terminology.

We conducted two types of analysis on the definitions that were supplied by the respondents:

- Qualitative analysis by first classifying definitions into different types and then comparing the type distribution between the different terms, and
- Quantitative word analysis to see the relation between different terms in accordance to word usage in the definitions.

Qualitative Analysis
For the qualitative analysis, all provided definitions (617 in total; some participants did not provide any definitions for certain terms) were labeled as one of the following definition types:

- Circular: definitions that use the terms being defined in the definition (e.g. HCI defined as 'How humans interact with computers'[*]),

- Extensional: definitions that consist mainly of examples, comparisons or summation of various aspects (e.g. HCI as 'This is more of a science, and psychological field. You can get a PhD in this.'[*]),

- Genus-differentia: definitions attempting to describe the term as a subset of something larger, satisfying certain conditions (e.g.IxD defined as 'The study of the reciprocal relationship between humans and computers.'[*]),

- Historical: definitions that attempt to describe the term from historical perspective (e.g. UCD as '…mostly identified with Don Norman and his students out of UC SD back in the late 80s.'[*]),
- None: comments from respondents that were not a definition (e.g. 'No clue!'[*] for XD)
- A combination of above mentioned types for some cases, if the given definitions exhibited characteristics of multiple types (e.g. both extensional and historical).

This set of types was decided on through inductive labeling. While we are aware of other types of definitions that are used in philosophy, lexicography or logic, we found that this set covered all definitions given by the respondents.

We performed analysis of variance to compare how different definition types and certainty are distributed between the terms. Levene's test indicated that homogeneity was not met for any type of definitions and neither the certainty of correctness. The post-hoc Games-Howell test indicated that there is a significant difference in perceived certainty that the given definition was correct for HCC compared to all other terms ($p < 0.000$ for all), for HFE compared to Usability ($p < 0.031$) and UX ($p < 0.000$), and for UX compared to XD ($p < 0.004$). The levels of certainty for different terms are displayed in figure 1.

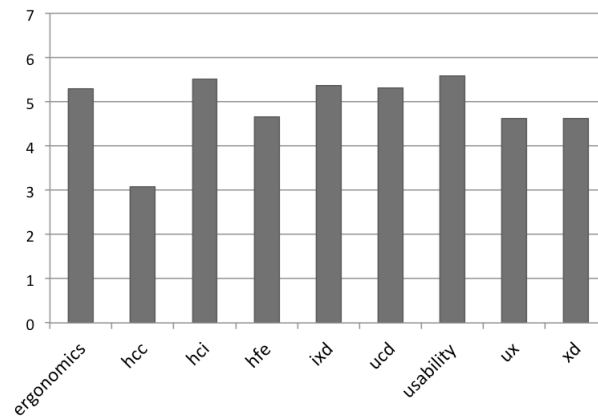[*] Actual quotes of definitions given by respondents.

Figure 1: Means of perceived certainty of correctness for definitions given for various terms.

Figure 2: Two dimensional MDS solution to word analysis.

There were many significant differences between different terms for various types of definitions, and most are evident from figure 3 displaying distribution of various definition types among the terms.

Quantitative Analysis
The quantitative analysis was approached from a mathematical angle: if two terms carry similar meaning it is reasonable to expect that they will often be described with the same words. The definitions were stripped of punctuation and stop words (common words in English language) and reduced to stems using Porter stemming algorithm [porter]. Next, it was counted how much each word was used in definitions for a term. The results were used to calculate a dissimilarity matrix between the terms (based on Euclidian distance). Finally, we applied Multi-Dimensional Scaling (MDS) on the dissimilarity matrix to find the relationship between
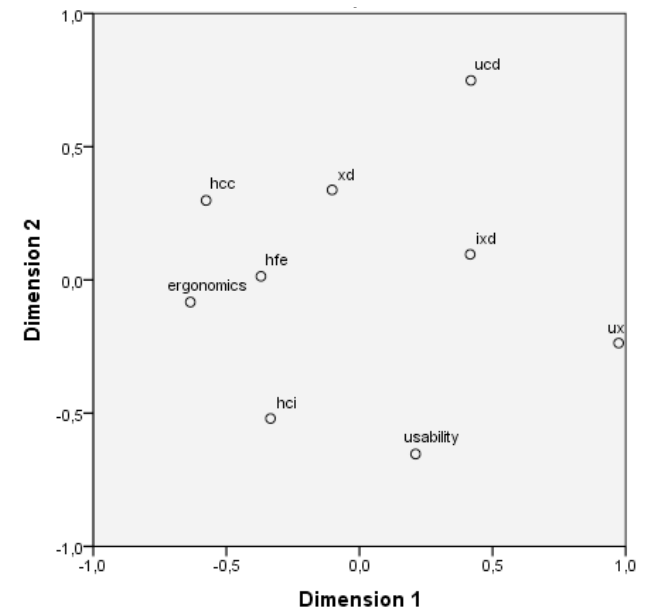
the terms. The 'elbow' in the scree diagram indicated that the optimal number of dimensions is 2, and the solution is presented in figure 2.

A couple of things stand out in the solution: ergonomics and HFE are terms that are closely related, while UX, IxD, UCD and usability seem to be very distinct from each other. The horizontal axis seems to match popularity of terminology throughout time, with older terms, such as ergonomics and HFE on the left and newer buzzwords such as IxD and UX on the right. The interpretation of the vertical axis is not obvious.
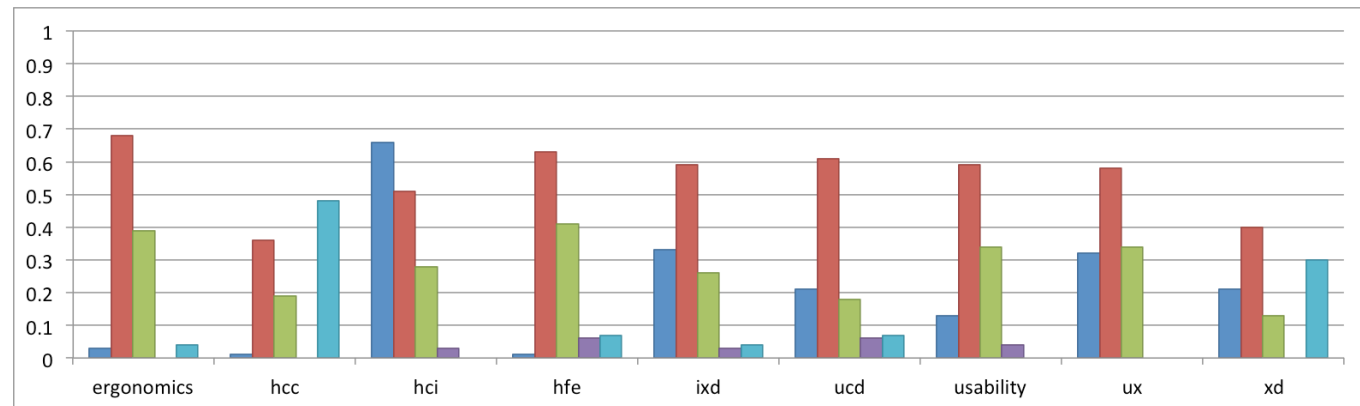
Figure 1: Percentages of different types of definitions per term. 1 (blue) - circular, 2 (red) - extensional, 3 (green) - genus-differentia, 4 (purple) - historical and 5 (cyan) - no definition given

When looking individually at the definitions, we noticed that for most of the terms people have very different understandings – the respondents would often group the terms together (HCC: 'I am not familiar with this as a term distinct from UCD', and 'This is the same thing as HCI.', Ergonomics: 'See HFE', HFE: 'Another term for XD and UX designer', and 'New name for HCI?', XD: 'Can't tell the difference between this or IXD or UX', etc.). This further illustrates that there is lack of clear common ground for communication, as people seem to have a 'feel' for what the collection of these terms represent, but not a precise concept of each one on its own.

Discussion
Our community is interdisciplinary by nature; it is a rather large and complex organism that thrives on collaboration. Unclear vocabulary obstructs the exchange of ideas and obscures opportunities for collaboration. In order for this community to grow and make meaningful progress, it needs to articulate clear paths of communication through shared terminology.

We set out to collect information that would more clearly indicate the state of the field, and ultimately help clarify where does the confusion come from and why. Through our historical reflection we found that while different disciplines emerged in very specific environments and situations, they would quickly be adapted across different fields, albeit under different name. The nature of the disciplines itself is flexible, as they offer different ways of approaching and solving problems – making them both flexible and widely adaptable, as well as inconsistent.

This is further reflected in the myriad of descriptions of today's educational programs and job requirements. On one hand, while job requirements might demand something specific from the (potential) employee, generic terms are often used to describe this, diluting their preciseness. On the other hand, academic programs, although their content is comprehensive and touching on many subjects, often have highly specialized names, which further amplify the image of ivory towers that are not accessible by average humans.

The survey is perhaps the strongest evidence of verbal disagreement that is going on. Even seasoned professionals often seem to lack vocabulary to describe

a discipline in which they partake on a daily basis, and many people resort to naming examples when describing them, rather than giving an eloquent, precise definition. On top of that, many individuals construct their own 'tree' of interrelations between the disciplines such as UX, IxD and HFE, simply because there is no clear agreement on where one starts and another begins – it is very much a recursive problem.

The first step to solving the problem is understanding it, and we think that all the research that we present here goes a long way in that direction.

Conclusion

Besides being a means of communication, language and more specifically, vocabulary, are cognitively significant. Research in linguistic relativity suggests that "linguistic processes are pervasive in most fundamental domains of thought" [1]. With this in mind, fine-tuning terminology towards an incisive vocabulary could enable us to more easily articulate and conceive existing ideas as well as construct new ones. Moreover, these ideas could grow into shared, reference frameworks for improving research, design and development methodologies. Lastly, these frameworks could help create and inform educational programs, which are currently too few, young and disperse to infuse a sense of each discipline's role and identity.

We therefore argue that there is a need to describe the field as a unified whole, in order to conceptualize it more clearly and to describe how sub-disciplines are related to one another. We suggest that Experience Design (XD) is the superset of all things experience-related, including HFE, Usability, HCI, IxD, and UX. We refer to XD because based on our research it is the best fitting common thread of the disciplines discussed, and because it has been similarly characterized by others [1, 4]. However, we propose that a conversation around this topic be further continued within the community. We also suggest that XD disciplines need more clear descriptions and definitions.

We suggest that there is much to be learned from questioning the ambiguity of our current terminology through the history of XD disciplines, and that revealing the tensions between them can enable us to more explicitly reveal obstacles and opportunities, as well create more effective forms of communication and collaboration.

We thus propose that those working in the field of XD begin to have open discussions with peers about the meaning of terminology. These discussions should be supported by clear, open and shared platforms of knowledge, to aid in converging on meaningful descriptions of disciplines and their relationships to one another. We also suggest that individuals be open to changing how they define and name their disciplines, when such changes are applicable. Lastly, we suggest that as a community we must begin to take an approach of responsibility for the terminology we use, with the awareness that our vocabulary is shaping how we perceive, communicate and progress our idea.

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