
Towards Metrics of Meaningfulness for Tech Practitioners

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ABSTRACT

HCI and the tech industry are increasingly interested in designing products that afford meaningful user experiences. Yet while several metrics of meaningfulness have been suggested, their utility and relevance for industry is unclear. We conducted workshops with 9 welfare technology companies and presented them with different metrics from existing literature in HCI, psychology, and industry, to evaluate their product and consider how relevant designing for meaningfulness is for them in their practice. We point to four metrics which companies considered particularly relevant, and suggest that further defining metrics of meaningfulness in HCI would be beneficial to both academia and industry.

CCS CONCEPTS

• **Human-centered computing** → **HCI design and evaluation methods;**

KEYWORDS

Meaningfulness, meaning, eudaimonia, user experience, welfare technology.

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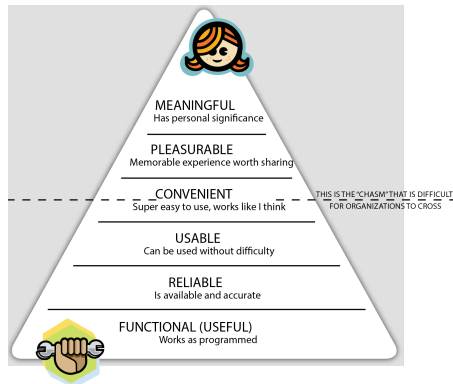


Figure 1: Meaningful UX is often considered a peak goal for Interaction Designers. Image from [1, p. 12].

Worksheet 1

Personal development: How does it contribute to a sense of identity?

Moments of significance: How does it facilitate personal transformation?

Value over function: How does it offer more than convenience?

Meaning in everyday life: How can it adapt to fit what we need in a given moment?

Critical reflection: How does it make us reflect on ourselves, our actions, and the products we are bringing into the world?

Sidebar 1: Questions based on ongoing research and derived from [3]. All 6 worksheets are included as supplementary material.

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INTRODUCTION

HCI is increasingly interested in considering how technology use impacts the human experience of meaning [10, 11], as well as how to design for and foster meaningful user experiences [3, 5, 6, 14]. This interest is also shared by industry, as evidenced by Facebook’s CEO Zuckerberg recently declaring their aim to prioritize “meaningful interactions” [16]. Similarly, many practitioners consider meaningful user experience (UX) the ultimate goal to aspire towards (see Figure 1). However little is known about how to consider “meaningfulness” in the design and evaluation process [9, 12]. While HCI researchers [3, 9, 14] and practitioners [15] have suggested several “metrics” of meaningfulness, their utility and relevance to industry remain unclear.

As there is no concrete consensus on what meaningfulness entails [4, 13], we explored six different metrics of meaningfulness in a series of workshops with welfare technology practitioners. These workshops fulfilled requirements for part of an ongoing research project, funded by the Danish Ministry of Higher Education and Science, who are interested in understanding what designing for meaningfulness means for welfare technology companies. This case study describes the workshops and the findings, namely that the welfare technology companies taking part in the workshops are keen to take meaningfulness into account when designing and evaluating their products. Further, we discuss the benefits and challenges inherent to the various metrics of meaningfulness and point to four metrics in particular which may benefit industry. A video featuring the companies is available here: <https://youtu.be/C0RynTA-sRs>

METHOD

Workshop Setup

Nine workshops were held over a period of one week. Each workshop was two hours long, and companies were presented with 6 worksheets featuring different “metrics of meaningfulness” (see next section). The workshops were attended by the CEO (or similar level person) from the company, two external consultants, who were interviewing and taking notes respectively, as well as the first author, who observed and then joined discussion after the workshop. The first author briefly presented their work in designing for meaningfulness and an overview of the worksheets. The external consultant then facilitated the workshop. Worksheets 1, 2 and 3 were presented in an interview style as these questions enabled discussion. Worksheet 4 was filled out silently to give companies a chance to pause and reflect. Worksheets 5 and 6 were presented in the form of ten-point Likert scales (as the

Worksheet 2**Coherence**

- Is it clear to the user how the product connects to their life?
- Does the product make sense to the user?
- Does interacting with the product feel right?

Purpose

- Does the product help users identify personally important goals??
- Does the product help users set manageable smaller goals to reach personally important goals?
- Does the product support users in reaching and achieving those goals?

Significance

- Does the product matter to users beyond the momentary interaction? How so?

Sidebar 2: Questions based on the components of the experience of meaning [4, 13].

original questions from [7, 8] were from a statistical psychology study) and companies were asked to think-aloud, presenting their rationale for their rating. Participants' comments were audio-recorded, transcribed and translated into English, before we analysed the data via affinity diagramming [2].

Metrics of Meaningfulness

To account for different facets and nuances of meaningfulness, we employed a variety of potential metrics drawn from psychological research on meaningfulness, existing metrics for industry practitioners, and our own ongoing research. These included the “mechanics of meaningfulness” ([3], see Sidebar 1); a set of questions developed by us to inquire into the experience of coherence, purpose and significance, which have been argued to constitute the defining characteristics of meaningfulness in recent psychological research ([4, 13], see Sidebar 2); the physical characteristics of meaningfulness ([3], see Sidebar 3); the meaning and purpose questions from the Better Things industry tool [15], and finally, the hedonic and eudaimonic motives for activities (HEMA) scale [8], as well as the subjective experience of meaning scale [7], as both have been previously applied to UX research [14], and have been argued to serve as potential generative questions [14].

Company Recruitment

The first author had met the companies at a health and rehabilitation trade show and invited them to participate in the workshops. Ten small to medium sized companies were invited and 9 were able to participate. Our ambition was to have a variety of companies which represented various health care products (welfare technology companies). The companies ranged from those with no technology currently present in their products (but who might consider it in the future) to those with a device. Sarita Caretech, for example, already has an interactive, hardware based product. Their product is the Sarita Pearl, a wearable, jewellery inspired personal alarm system which calls for help in case of emergency. Sarita's Chief Marketing Officer who has also contributed to the user experience design of their product attended the workshop. This company was chosen as the exemplar for their relevance to the field of HCI and quotes and anecdotes from them are used throughout this work. Alongside Sarita, we present four participant companies – who agreed to having their company names and quotes published – while exemplifying our four highlighted metrics of meaningfulness.

METRICS AND FINDINGS

Our ambition with these workshops was to explore how the companies responded to the different metrics of meaningfulness, and which of these made the most sense for them.

Worksheet 1: Mechanics of Meaningfulness (Sidebar 1). Companies were asked to select two of the Mechanics of Meaningfulness to focus on as we did not have time to go through all of them. Companies

Worksheet 3

Non-screen: If the product has a screen, why does it need this?

Tangible: What are the physical characteristics of holding and engaging with this object?

Everyday: Do we use it every day or only once in a while?

Craft: How does this relate to traditional craft?

Sidebar 3: Physical characteristics of meaningfulness [3].

primarily chose “Value over function” and “Meaningfulness in everyday life”. One chose “Moment of significance” and two chose “How does it establish personal values?”. The mechanics: “Personal Development” and “Critical Reflection” received no selections from the companies, which might be a reflection of the fact that all the companies were healthcare based. It should also be noted that for most companies, three types of users were identified: the citizen, the caregiver and the municipality. The products typically helped to save the municipality money, helped the caregiver to do their job, and helped provide a better quality of life for the citizen. From this worksheet, we present below two examples of how the companies responded to these metrics:

Meaningfulness in the everyday: Zibo Athene makes a weighted vest for inducing Oxytocin and calmness. Their product is typically used before people leave the house to enter society and go to work or be social. They explain “this can make a big difference for an individual which wants to set small goals such as participate and function in the everyday.”

Value over function: DEMOS10 by Brane is a tool to monitor patients with dementia who might have sleeping problems. They explain how the data is the function, but the value is in the insight: “the personal transformation exists in the insight”. The data provided highlights when a person with dementia has, for example, been wandering, lost after going to the restroom during the night, and with the insights provided by the data, caretakers can “feel secure in their decision based on objective data instead of subjective observation”.

Worksheet 2: Components of the Experience of Meaning (Sidebar 2). Companies typically focused on one user group (care taker, citizen or municipality) for ‘personal goals’ and then considered the overall significance to all user groups. Sarita explained how for the elderly, “if they have a stable everyday life, then maybe that’s their goal, keep the status quo” and elaborated: “The meaning was different for each group. For elderly it’s their extra ears and brain if anything happens. They can rely on it to call for help. For the caregiver, they could take precautions and protect the elderly.”

Purpose (personal goals): For Boblberg – an online platform for social gathering, the user decides which goals are important for them, for example, someone with social anxiety might want to go for a walk outdoors with someone else, but not necessarily go into the city or meet with other people. Through the Boblberg platform, they can find someone to do this activity with and as Boblberg explains, “everyone has a right to be part of a community. Through a larger focus on togetherness and people, we can improve the health of society.”

Significance (more than momentary interaction): HopSpots is a company creating programmable discs which children can jump on and interact with via light and sound. They explain how HopSpots allows people to realize their impact on the world around them, namely, how users “got an ‘ah-ha’ experience and pride about how it was them who had made this”. Further, “actually being able to do this themselves (which) gives a personal transformation”

Worksheet 3: Physical Characteristics of Meaningfulness (Sidebar 3). This worksheet focused on four qualities: non-screen, tangible, everyday and craft which emerge from a larger research study currently being conducted (see [3] for preliminary findings). All companies but one had non-screen products (one was an online portal), and all were tangible in some way. Each felt that they strongly resonated with the concept of something 'everyday' as people need to use the products on a daily basis and few considered traditional craft, as most were designed for medical industrial standards for cleaning and durability. Sarita described how they worked with jewellery designers to create something beautiful that the elderly would accept and wear on a daily basis, and designed it to be an individualized gift. "We designed the opening experience... When the nurse comes with it and says "Eva, this is for you, this is the design you chose" then Eva should say "Oh it's mine, nice". And then it's her individual one." The meaningfulness present is for the citizen in terms of the significance of having something which is personalized and which keeps them safe. As Sarita explained, "If the product is not valuable for the end user then they will not use it and it will be another product in a drawer."

Worksheet 4: Better Things – Purpose and Meaning Questions. Companies were asked to silently write their answers and ask for clarification if they needed it. Many of them had trouble answering some of the more abstract questions such as "is it art?" or "how does it provide beauty to your life?". For many of the questions, they simply filled in their product pitch, such as how it solves a problem but for these more abstract questions, many companies stated "these are good questions, they are making me think in different ways, but I don't know how to answer it." Sarita answered the question, "How does it create a sense of wonder?" with "Its intelligence - 'hidden technology' in a piece of jewellery". While these questions did result in some interesting answers such as this one, it was most interesting that 4/9 companies chose not to answer "how does it make me a better person?" which we see as contributing to the lack of consideration about meaningfulness in the product in terms of purpose, significance, personal development or value over function.

Worksheets 5 and 6: HEMA and Subjective Experience of Meaning Scales. Companies were eager to discuss their rationale for the rating they gave their products, but overall, were confused by the similarity of the terms presented by Huta and Ryan [8], and Huta [7]. Many companies had problems differentiating, for example, between something 'dear' to me, something which I 'treasure', or something which is 'precious'. The same confusion arose from 'seeking relaxation' and 'seeking to take it easy' or the nuanced difference between 'playing an important role in some broader picture' versus 'I could see where they fit into the bigger picture'.

Summary of Findings

Companies seemed to give the most in-depth answers to worksheets 1 and 2. Sarita reflected on how the Pearl contributed to purpose and value over function: "The product has one function... the

microphone and loudspeaker. It creates the value of feeling close to the caregivers who surround you and protect you in emergencies... The whole human to human value is pretty important.” Here they specify the function, and then focus on the value. Sarita explained: “the core functionality is an alarm. It’s for an emergency. The main functionality is: where are you, did you fall or not, did you push your button or not? You can also detect if it is on the body or not. The whole package helps create these bigger goals.” This answer indicates how the questions about meaningfulness and eudaimonia may promote more careful differentiation of a product’s function and value, as well as encourage reflection on what is most relevant for the users. Other companies similarly answered in detail, both providing their product pitch and then digging deeper, looking to what really matters for their users.

The Better Things questions acted to provoke critical reflection, but ultimately the companies did not provide much more than their product pitch. The HEMA and subjective experience of meaning scales were deemed confusing in terms of language and the nuances between terms, but did provide some opportunity for critical reflection, such as when companies challenged themselves, for example “Put it as a five, in the middle ground, as it’s a very fluffy term, and it’s not really proven yet that our product would be able to do so, for the end user”.

Feedback about the workshops demonstrated the relevance for companies: “It was a great pleasure and I look forward to hear what the future brings when meaningful design is a part of product development”, “Thank you for some great hours, reflective thinking and good feedback on our product”, and “It was really interesting, we certainly got some tools we can use moving forward”. It should be highlighted that companies dedicated their own time and resources, signing off on a minimum of 10 hours used (transport, preparation, workshop and aftermath). Together with the present work having been financed by the Danish Health and Welfare Technology network, this speaks to the relevance for designing for meaningfulness for industry and the need to establish standardized measures to evaluate meaningfulness in upcoming or established products and services.

DISCUSSION

Companies were clearly interested in the concept of designing for meaningfulness, indicated both by the companies’ time investment in the workshops and via the positive feedback provided. In this light, it is important to determine what appropriate metrics of meaningfulness are, and how to evaluate these. We have presented six different ways of evaluating potential metrics and find that companies responded most thoughtfully and critically to four metrics in particular: *meaningfulness in the everyday*, *value over function*, *purpose* (personal goals) and *significance* (beyond momentary interaction).

These workshops indicated to us that companies all believe that their products are meaningful, however it is in the nuances where the quality metrics of meaningfulness emerge and can be further evaluated. We suggest that these four metrics act as a starting point for researchers to begin exploring aspects of designing for meaningfulness in industry, and suggest that the other metrics are further

evaluated to determine in which contexts they might be relevant. When asked if they thought the metrics of meaningfulness might be a viable service to offer industry in the future, Brane, who has over 30 years experience in consultancy, said: "I think it is undervalued - these things, to use money on these. I think it is difficult to sell but I really think it's valuable. It's a good way to do it, to come at it from these different angles and to refine it."

Both from our discussions with companies and discussions with industry, we anticipate that these metrics of meaningfulness may primarily serve companies in the ideation and evaluation phases of product development. In the ideation phase, they may use it to ask why they are building this product or service, for whom it is intended, and what impact that will have on the stakeholders from an aspect of designing for meaningfulness. In the evaluation phase, companies may consider employing these metrics to assess end users' experience with the product or service and adapt it as needed.

Limitations and Considerations

In these workshops, we focused on how specifically Welfare Technology companies might use metrics of meaningfulness to evaluate their product or service. Future work is necessary to assess whether these metrics readily generalize to other technologies and domains.

Moreover, it became apparent that just asking whether a product was considered 'meaningful' as per Huta's Meaningfulness scale [8] was not sufficient: Most companies gave their products the highest rating. However, when they discussed the nuances of how their product was meaningful, such as in regards to meaningfulness in the everyday, value over function, purpose or significance, then it was necessary to consider how their product related to each of these aspects.

Finally, the format of the worksheets impacted how companies answered questions. Generally, interviews (worksheets 1, 2 and 3) allowed for more discussion, quiet reflection and writing (worksheet 4) allowed for shorter answers, and talk-aloud Likert scales (worksheets 5 and 6) allowed for conversation, but less in-depth than interviews. Also, language should be taken into consideration as the interviews were primarily conducted in Danish with the exception of two companies who preferred English.

CONCLUSION

We explore the potential of six metrics of meaningfulness for welfare technology practitioners. We found that providing a more nuanced and multi-faceted account of meaningfulness as presented via our worksheets, helped practitioners critically reflect and debate about their product. We point to four metrics in particular which companies responded most thoroughly to: meaningfulness in the everyday, value over function, purpose (personal goals) and significance (more than momentary interaction). We suggest that future work looking at the metrics of meaningfulness explore these terms further and expand to evaluate more than welfare technology companies.

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