Understanding Digital Wellbeing within Complex Technological Contexts

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Abstract

A growing — yet debated — discussion around the negative aspects of overusing technology led researchers and practitioners to consider a new kind of psychological digital wellbeing, giving rise to the flourishing of digital self-control tools (DSCTs).

As many people nowadays own and use several devices, there is a need to understand better their overlapping use (and non-use) and the relationships to digital wellbeing. This special issue aims to provide the academic and industry research communities a venue for work at the state-of-the-art on digital wellbeing and DSCTs, with a particular focus on digital wellbeing within complex technological and social contexts.

1. Introduction and Motivation for This Special Issue

These last years have found some people living in an "infosphere" made of various devices, with an overlapping use of personal computers, smartwatches, and smartphones for work, social media, and messaging. Undoubtedly, technology improves our lives in several ways: without it, for example, lockdowns and restrictions due to COVID-19 would have been even harder to overcome. The

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dark side of this coin, however, is represented by the growing — yet debated — discussion around the negative aspects of overusing technology that is nowadays led by both mainstream media [1] and researchers working in different areas, including smartphone addiction [2] and screen time [3]. Although a large part of this narrative is often speculative [4], there is an emerging body of evidence suggesting that excessive and frequent use of technological sources like mobile devices, social media, and the Internet, in general, may create problems for people's mental health [5] and social interactions [6]. What is clear, in particular, is that many people nowadays feel conflicted about how much time they spend on their devices [2, 6], mainly when technological sources are used passively [7].

This body of evidence has recently prompted researchers to consider a new kind of psychological "digital wellbeing" that defines the impact of digital technology on people's lives [8, 9]. In parallel, researchers and practitioners have developed and tested several digital self-control tools (DSCTs) to support users in self-regulating their technology use [10, 11]. These tools typically employ interventions like timers and lock-out mechanisms, through which users can set up a daily limit for using applications like Facebook or Instagram. Despite this growing interest in improving people's relationship with technology, the digital wellbeing topic is nearly always contextualized to consider single technological sources at a time, with a prevalence of studies and DSCTs that focus on smartphones only [11]. However, people nowadays use several devices in different contexts and for a variety of purposes. Therefore, there is a need to understand better the relationships between the complex and overlapping use/non-use of digital devices and (other) people's digital wellbeing, encompassing individual and contextual differences, as well as the social factor. Indeed, recent studies demonstrate that digital wellbeing issues extend beyond smartphones, with the most problematic behaviors happening in social contexts [12] and deriving from multitasking with different devices to perform uncorrelated tasks [13].

In this special issue, we draw together articles reporting on digital wellbeing and DSCTs, focusing on digital wellbeing within complex technological and social contexts, e.g., multi-device systems. In the following sections, we discuss

two key areas relevant to the special issue, i.e., defining and supporting digital wellbeing. We then conclude by summarising the three papers included in this special issue.

2. Defining Digital Wellbeing

In recent years, there has been growing concern about the negative effects of technology overuse [14, 15]. Studies have shown that excessive use of devices such as smartphones [2] and social media [16] can negatively impact daily activities, such as driving [17], studying [2], and working [18]. Moreover, it can lead to the development of compulsive behaviors [19] that erode people's autonomy and sense of control [15].

Despite this evidence, technology companies continue to employ deceptive design tactics to maximize user engagement and time spent on their digital services, as part of the Attention Economy business model [20]. For instance, automatically played videos on YouTube can make users feel less in control [15]. Similarly, social media apps with infinite scrolling can encourage compulsive behavior [21].

Given these issues and challenges, researchers are now exploring the concept of "digital wellbeing," a new field of psychological inquiry. Despite being a relatively new topic, there is no comprehensive definition of digital wellbeing yet. While Burr et al. [8] define it as "the impact of digital technologies on what it means to live a life that is good for a human being in an information society," the HCI community tends to equate it with technology overuse and screen time [3, 9, 10]. However, using screen time as the sole measure of digital wellbeing does not capture the diversity of user goals and technology usage patterns [22, 23]. Additionally, most existing research focuses on single technologies, such as smartphones [9], with a strong bias towards young adults and university students [11]. In today's multi-device world, people often use multiple devices simultaneously [24], making it important to consider multi-device and cross-device interactions for a more comprehensive understanding of

digital wellbeing [25]. For example, digital wellbeing is particularly important for children, who now spend almost double the time online than they did in 2010 [26].

3. Supporting Digital Wellbeing

In the past decade, researchers and practitioners in the field of HCI have attempted to enhance digital wellbeing through the implementation of Digital Self-Control Tools (DSCTs) [10]. These DSCTs are dedicated mobile apps (e.g., [9]) or web browser extensions (e.g., [27]) that enable users to monitor their technology usage and manually establish interventions such as usage timers and lockout mechanisms. For instance, MyTime [28] is a mobile app that allows users to monitor the time they spend on specific apps and set daily time limits. Let's FOCUS [29] is another mobile app that provides users with the capability to enter a "virtual room" where specific apps are blocked and notifications are suppressed, while LocknType [30] requires users to complete lockout tasks before accessing distraction applications. In addition, many DSCTs are readily available for download on digital stores like the Google Play Store and Apple App Store, and similar tools have been integrated into the mobile operating systems of Google [31] and Apple [32].

While DSCTs are widely used and easily accessible, some researchers have expressed concern about their effectiveness in supporting digital wellbeing. These tools rely on users to constantly monitor and engage with them in order to establish and maintain healthy technology habits [11]. However, this self-monitoring approach is limited in that it requires sustained user effort and can only have short-term effects, as motivation to use the tool is likely to decline over time [33]. Additionally, the intervention strategies employed by DSCTs, such as usage timers and lockout mechanisms, are often simplistic and target specific devices only, without taking into account the user's context or intentions [10, 13]. As a result, users may have unrealistic expectations and may abandon the tool if their expectations are not met [33].

To address the limitations of traditional DSCTs, the HCI community has proposed alternative approaches. One direction is to develop more advanced DSCTs that can take into account users' context and usage intentions [34, 35], rather than relying solely on self-monitoring [10]. Another approach is to consider a more comprehensive approach that goes beyond technology and incorporates educational, social, and political aspects in addressing digital wellbeing [13]. Overall, how to design effective DSCTs leading to long-lasting effects is still an open challenge.

4. Special Issue Content Overview

In this special issue, we assemble three articles that help explore digital wellbeing as a complex construct encompassing both technological and social contexts. The papers allow for a better understanding of the relationships between digital device use, DSCTs, and people's digital wellbeing, providing implications for different contexts and populations.

The paper *"The Goldilocks level of support: Using user reviews, ratings, and installation numbers to investigate digital self-control tools"* [36] is an investigation of 334 contemporary DSCTs available in online app stores. The authors' analysis considers user reviews and ratings, DSCTs' functionality, and installation numbers. Results show that contemporary DSCTs are important for helping users focus on less instantly rewarding tasks, especially in productivity-related contexts, such as work and study. Users would like flexible tools that can adapt to their definition of distracting use, providing carefully calibrated support without feeling too coercive. At the same time, users are also likely to criticize DSCTs if they are too easy to override or if the intervention strategies are too strong. Overall, the paper deepens our understanding of the pros and cons of these technologies, offering implications on how design patterns in DSCTs interact and how psychological reactance to DSCTs can be reduced.

The paper *"Emotion trajectories in smartphone use: Towards recognizing emotion regulation in-the-wild"* [37], instead, offers an interesting perspective

relating digital wellbeing to emotion regulation. It is a concrete example of how to move beyond the contemporary screen-time-only vision of digital wellbeing. Emotion regulation is the attempt to change an emotion that interferes with current goals. Digital emotion regulation is a new research field in psychology and HCI that studies the potential benefits of technology for regulating emotions. The paper presents a novel methodology for detecting patterns of emotional change during smartphone usage. Results of a study with 20 participants show that consumer technology can detect non-random emotion patterns in naturalistic settings, thus opening the way to a promising approach towards quantifying the impact of smartphone usage on emotional trajectories and mental and physical health.

Finally, the paper *"Design for social digital well-being with young generations: Engage them and make them reflect"* [38] highlights the need to bring the social sphere into the digital wellbeing discourse. The authors consider complex ecosystems in which people can interact with ubiquitous and connected devices in social situations. The article is a further example of an alternative approach to contemporary DSCTs, since it focuses on educational strategies. The authors present a design toolkit named IoTgo that is aimed at engaging young generations in understanding technology and promoting their critical reflections on technology. The toolkit focuses on promoting education in responsible design as a key to pursuing digital social well-being. The toolkit guides non-expert designers, particularly young generations, to ideate, conceptualize, program, test, and reflect on IoT-enhanced smart things. Results of a study conducted with high school students using the toolkit show that it engaged and solicited critical reflections through design geared towards social digital well-being.

In conclusion, we hope that this special issue has provided further evidence that the research space around digital wellbeing is still growing and there is a need for it to encompass a wider range of implications and situations. Moving beyond single device use and simplistic DSTCs, we need to explore more ways to avoid psychological reactance, better support emotion regulation and take into account social interactions when considering digital wellbeing.

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