

Exploratory study of

Addicting Design

Written by

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2. Liu T, Potenza MN. Problematic Internet Use: Clinical Aspects. In: Aboujaoude E, Koran LM, eds. *Impulse Control Disorders*. Cambridge University Press; 2010:167-181.
3. Naomi A. Fineber et al. Advances in problematic usage of the internet research – A narrative review by experts from the European network for problematic usage of the internet, *Comprehensive Psychiatry*, Volume 118, 2022, 152346, ISSN 0010-440X. <https://doi.org/10.1016/j.comppsych.2022.152346>.
4. <https://www.theguardian.com/society/2025/jun/18/teenagers-social-media-mobile-phones-video-games-mental-health>
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Executive Summary

Social media harms have been well documented for years, but only more recently has the discussion of harms turned towards mental health impacts. Within this, digital addiction to social media, and the role of technology and design in facilitating this addiction has come into focus. This paper aims to summarize the state of digital addiction and addictive design research related to social networks to inform policymakers, researchers and civil society on actionable next steps for regulation on addictive design in social media. This research and report, conducted and created by Convocation Research + Design with Dr. Romaine Gad el Rab, was commissioned by Bits of Freedom with support from Stimuleringsfonds Creatieve Industrie. Across 2025, we conducted an extensive literature review, interviewed 12 experts across psychiatry, mental health, policy, technology and design; and held an interactive workshop for feedback on our findings.

Digital Addiction as a Mental Health Concern

‘Digital addiction’ is not yet a recognised mental health disorder, and there is no agreed-upon definition or diagnostic criteria for ‘digital addiction’ per se, despite the phenomenon being widely quoted in popular culture. However, ‘problematic usage of the internet’ has been an area of research interest for over twenty years within the medical community, and a number of studies have been done to better understand the impact of various aspects of internet engagement on mental health.^{1,2,3} Digital addiction is a topic being more widely covered in popular media and general press articles, often documenting anecdotal data from a handful of communities or individual user’s first hand experiences with feelings of addiction, problematic usage, or overall negative feelings from the internet, smartphones and social media.^{4,5,6} This anecdotal data is important in documenting this emergent health crisis of digital addiction and its related harmful impacts.

Design’s Role in Addiction

Design plays an important role in harming a user, and limiting their autonomy, and agency. All software and hardware are ‘designed.’ Thus, any type of digital addiction or problematic use of the internet or software a user has, design will play a role in that addiction in some way, shape or form. Many of the interface elements or product tooling described in the literature on addictive design, are also elements

7. https://www.bitsoffreedom.nl/wp-content/uploads/2025/06/20250616-report-exploratory_study_manipulative_design.pdf
8. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>
9. <https://arxiv.org/pdf/2309.09640>
10. <https://www.tandfonline.com/doi/full/10.1080/13600834.2025.2461958#d1e156>
11. Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) [2022] OJ L 277/1, recital 67.
12. <https://arxiv.org/pdf/2309.09640>
13. <https://arxiv.org/pdf/2101.04843>
14. <https://doi.org/10.4018/JGIM.322778>
15. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6679162/>

of attention capture damaging design, which is a subcategory of manipulative design patterns, often called dark patterns, a type of harmful design that impacts consumers. However, not all types of addictive design elements could be categorized into manipulative design patterns (e.g. often referred to as dark patterns).^{7 8 9} What makes addictive design elements addictive is that multiple of these elements are occurring together (e.g. endless scroll, showing content users want to see, recommendation algorithms, etc); whereas a single dark pattern can occur ‘alone’ or occur once and still be a dark pattern. Additionally, some elements of addictive design can include pro-social or pro-user design, but manipulative design patterns are not ‘pro-user’ or beneficial to users. Manipulative design patterns are design elements, choice architecture or ‘practices that materially distort or impair, either on purpose or in effect, the ability [of users] to make autonomous and informed choices or decisions^{10 11}’ “in relation to digital systems regardless of the designer’s intent¹².”

How Addictive Design Differs from Manipulative Design Patterns

What makes addictive design different from other types of harmful design is that addictive design elements must have multiple elements occurring together to facilitate addiction. Unlike manipulative design patterns, in which a product can have one instance of a manipulative design pattern or many. The most privacy preserving and GDPR respecting website can still have a manipulative design pattern if that website makes it difficult to unsubscribe. Manipulative design patterns have other types of harms including increasing cognitive burden, financial loss and privacy loss.¹³

Some elements of addictive design include a variety of pro-user design, or design that can be as positive elements, such as showing users what they like, building out community via social network ties and social identification¹⁴, and making it easier to connect with friends.¹⁵ But, having a community is not enough to make the product addictive. It’s a variety of addictive design features together that facilitate digital addiction like social pressure, social capital, endless scrolls, temporal events, and others. **This combination of multiple factors might make it more difficult to regulate, given that some of these factors, like ‘Fear of Missing out’ (FOMO), do not manifest just via the design, but also from the feelings a user has about the content or their community.**

16. Compiled from a variety of papers that focused explicitly on addiction and design elements, including: Whatsapp and wellbeing: a study on whatsapp usage, communication quality and stress <https://dl.acm.org/doi/10.14236/ewic/HCI2017.85>; I-Cheng Chang and Chuang-Chun Liu. 2023. Are People Addicted to Social Networks? J. Glob. Inf. Manage. 31, 1 (Feb 2023), 1–23. <https://doi.org/10.4018/JGIM.322778>; People vs Big Tech's Briefing: protecting children and young people from addictive design <https://peoplevsbig.tech/briefing-protecting-children-and-young-people-from-addictive-design/>; 5rights Pathways: how digital design puts children at risk <https://5rightsfoundation.com/wp-content/uploads/2021/09/Pathways-how-digital-design-puts-children-at-risk.pdf> and <https://pmc.ncbi.nlm.nih.gov/articles/PMC6679162/>
17. <https://www.cignaglobal.com/blog/body-mind/getting-into-a-flow-state-of-mind>
18. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6679162/pdf/ijerph-16-02612.pdf>
19. Blohm, I., Leimeister, J.M. Gamification. Bus Inf Syst Eng 5, 275–278 (2013). <https://doi.org/10.1007/s12599-013-0273-5>

From our research and key papers, we have compiled a list of features, design principles, and types of design that can potentially facilitate addiction:¹⁶

1. **Endless Scrolling/Infinite Scroll/Endless Streaming/Autoplay:** automatically showing the next piece of content to provide a continuous, endless feed, makes it difficult to find a natural stopping point.
2. **Flow state or tunneling:** flow state is a positive mental state experienced when you're completely absorbed, focused, and involved in an activity. Time passes without you noticing and you're free from distraction, boredom and self-consciousness¹⁷.
3. **Endowment Effect/ Mere Exposure Effect:** “every time players visit the app platform and invest more time in the construction of the virtual world, it will get harder for them to detach from the game or even delete the app. The endowment effect might be both explained by ownership and loss aversion. Also, of importance is the mere exposure effect describing that the more often you are exposed to a certain (neutral) thing or application (here a game), the more you like it.”¹⁸
4. **Show Users What They Like:** this is in reference to content, friends, etc.
5. **Social Pressure:** such as blue ticks/ nudges/default settings. This system design of apps nudges a person to behave in a certain direction.
6. **Temporal Events/ FoMo:** Content only available for a set time/ Fear of Missing Out.
7. **Social Rewards:** refers to design elements such as likes, user comments, and general engagement.
8. **Gamification:** Gamification is defined as the use of game-design elements and incentives combined with desired behaviors in order to positively influence user motivation, behavior of users, and adherence¹⁹
9. **Notifications:** such as “likes”. Both the novelty and validation of another user's engagement triggers a dopamine release reinforcing the desire to post and interact creating a “social validation feedback loop”.
10. **Hyper personalised content algorithms or “recommender systems”:** Brain scans of students showed that watching a personalised selection of videos triggered stronger activity in addiction-related areas of the brain compared to non-personalised videos.
11. **Intermittent-reinforcement:** meaning users receive content they

find less interesting punctuated by frequent dopamine hits from likes or a video they really like. This keeps the user scrolling in anticipation for the next dopamine reward. This randomisation of rewards has been compared to “fruit machines” in gambling.

12. **Social Capital:** resources embedded in interdisciplinary personal relationships that support the development of social communities. It is an elastic construct used to describe the benefits of relationships with others. The concept of social capital began with the formation of trust within social communities and human interactions. Social capital is a pool of resources that can be harnessed through social connections embedded in social networks . SNS enables people to display themselves, express their social network, and develop relationships with others.
13. **Social Network Ties:** shared language, goals or interests in a community.
14. **Social identification:** sense of belonging or membership.
15. **Stickiness:** why a user repeatedly will return to a platform, and that stickiness are positive forms that can then contribute to addiction. Stickiness is: the frequency, depth, and duration of site visits. Website stickiness is associated with attraction, conversion, and retention.
16. **Quantifying and displaying popularity:** where visual elements, such as follower counts, likes, or how much the content has been shared, quantify and display the popularity of the content or user.
17. **Making it easy to share:** where an app makes it very prominent in the design and very easy to be able to share any kind of information or content.
18. **Offering In-app or in-game purchases:** this is where an app (or a game) offers or upsells extra features to, often, enhance the experience for users, and these extra features cost money.
19. **Making it easy to connect, with friend or follower suggestions:** the ease of being able to connect is key. Making it easy to engage in social network ties, find friends, and be able to ‘friend’ or follower profiles.

Recommendations for Policy Makers and Researchers

- 1) More research is needed across the board, focusing on addictive design, and interdisciplinary research
- 2) Further focusing on autonomy and consent in regulation

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- 3) Forcing Platforms to enact pro user design choices now, such as ‘the right to not be disturbed’ and other pro-user design changes
 - 4) Understand that this is a problem that impacts users in many different ways and that there is no one size fits all solution for digital addiction and addictive design.
 - 5) Understand that tackling this problem means funding mental health research in this area, and clinics to support people presenting in distress. Those impacted need help now, and there needs to be funding to support for those suffering from digital addiction.

Not if, but when social media addiction becomes recognised as a diagnosable behavioral addiction, there needs to be services ready and equipped to support those affected, including creating evidence based therapies..Until then, necessary public health approaches are still needed right now to support those impacted by social media addiction. We cannot delay mitigation while waiting for an official diagnostic definition. This is where creating nuanced policy to address addictive design is urgent, and investing in mental health support for those that do have problematic internet or social media usage. Social media addiction and addictive design are byproducts of our current technology systems, but these harms can be addressed, and hopefully mitigated with a multipronged approach of regulation, centering pro-user design, creating mental health support now for impacted communities, and emphasizing a duty of care from technologists and technology communities. Technology should be made to benefit society, not harm it. Now is the time to protect communities and mitigate harm. As Professor Shane Thomas said during our interviews, *“We cannot afford to take the 10-to-20-year process [that] has been in play for gambling and gaming with these new addictions. It is too urgent to have these incredibly lengthy delays.”*

20. Sohn, S.Y., Rees, P., Wildridge, B. et al. Prevalence of problematic smartphone usage and associated mental health outcomes amongst children and young people: a systematic review, meta-analysis and GRADE of the evidence. *BMC Psychiatry* 19, 356 (2019). <https://doi.org/10.1186/s12888-019-2350-x>
21. Liu T, Potenza MN. Problematic Internet Use: Clinical Aspects. In: Aboujaoude E, Koran LM, eds. *Impulse Control Disorders*. Cambridge University Press; 2010:167-181.
22. Naomi A. Fineber et al. Advances in problematic usage of the internet research – A narrative review by experts from the European network for problematic usage of the internet, *Comprehensive Psychiatry*, Volume 118, 2022, 152346, ISSN 0010-440X, <https://doi.org/10.1016/j.comppsy.2022.152346>.

Introduction

The harms of social media are nothing new, and have been part of a topic of popular discourse for some years now; however in more recent times, the psychological and mental health impacts and harms of social media have been called to the attention of regulators and lawmakers. ‘Digital addiction’ has come into the forefront as an issue with technology policy, especially with social media use. “Digital addiction” is a growing phenomenon, describing a pattern of *excessive or harmful use of an online technology* and is an issue that spans across the domains of technology, policy, and human behaviours (psychology/psychiatry), and our research, from our literature review to expert qualitative interviews, suggests that this topic must be approached in collaboration across these domains to create nuanced regulation, mitigations, and support for those impacted by digital addiction.

Our research and report focuses specifically on addictive design within social media and how the design of social media impacts, furthers or facilitates digital addiction in adult populations. This research and report, conducted and created by Convocation Research + Design with Dr. Romaine Gad el Rab, was commissioned by Bits of Freedom with support from Stimulerings Creatieve Industrie. This work aims to help inform policymakers, regulators, civil society and funders on the current state of digital addiction research and provide a basic understanding of addictive design to help support actionable next steps when it comes to regulation on addictive design in social media.

Understanding the Emergent Nature of this Field

Technology proliferation is rapid, with new technologies, features and algorithms introduced at increasing speeds. Traditional research cannot move at the pace of innovation and as such regulators must consider how to utilize existing research and expert opinion to safeguard potential harms and future harms to the public caused by such technologies.

It’s important to highlight that, at present, ‘digital addiction’ is not a recognised mental health disorder, and there is no agreed-upon definition or diagnostic criteria for ‘digital addiction’ per se, despite the phenomenon being widely quoted in popular culture. However, ‘problematic usage of the internet’ has been an area of research interest for over twenty years within the medical community, and a number of studies have been done to better understand the impact of various aspects of internet engagement on mental health.^{20 21 22}

23. <https://www.theguardian.com/society/2025/jun/18/teenagers-social-media-mobile-phones-video-games-mental-health>
24. <https://www.telegraph.co.uk/news/2024/08/01/fifth-of-teenagers-show-symptoms-of-smartphone-addiction/>
25. <https://www.theguardian.com/lifeandstyle/2024/jan/01/phone-quitting-diary-week-one>
26. <https://www.theguardian.com/commentisfree/2024/sep/16/why-i-quit-iphone-family-addiction-smartphone>
27. <https://www.nytimes.com/wirecutter/blog/ask-wirecutter-cell-phone-addiction/?nl=The+Recommendation>
28. Shapira NA, Lessig MC, Goldsmith TD, Szabo ST, Lazoritz M, Gold MS, Stein DJ. Problematic internet use: proposed classification and diagnostic criteria. *Depress Anxiety*. 2003;17(4):207-16. doi: 10.1002/da.10094. PMID: 12820176.

Within the general press and public landscape, there is a plethora of articles and anecdotal data from users describing negative feelings and emotions they have about their social media usage. Headlines such as ‘Teenagers who report addictive use of screens at greater risk of suicidal behaviour’²³, ‘Smartphone addiction is leading to “brainrot” Doctors say’, or ‘Nearly 1 in 5 teenagers displays symptoms of smartphone addiction’²⁴ and many other opinion pieces describe many dissatisfactions with social media use. In an article for the Guardian by Rhik Samadder, he reflected, ‘[that]I would catch myself zombie-scrolling for hours, and throw the phone across the room, shrieking: “Thief of my life, Thief of my joy!” before falling asleep again.’²⁵ In another Guardian article, Will Klempner wrote, ‘At the peak of my addiction, I would sit in the bathroom for hours after my wife had gone to bed, mindlessly scrolling, until I’d look up and realise another evening had slipped away, and all I had to show for it was a stiff neck and a sore thumb.’²⁶

This anecdotal data is outlining something very important, which are the **feelings and concerns of users who do not like how they use social media**, and/or do not like how social media is impacting their mental health, wellbeing and emotions, Some of these articles will often be coupled with tips, new products and tools on how to manage one’s time on social media, ways to ‘meaningfully’ use social media, and even ways to stop using smartphones to better manage one’s time with technology²⁷ – but should this be left to the public to seek their own interventions or can interventions, mitigations, regulations or other forms of ‘support’ be developed to be able to use social media how they would like to. Even if the negative impacts a person is feeling does not fit an emergent criteria of problematic internet usage²⁸, this phenomena of feeling like one can’t use social media how they would like to is valid, and it speaks to the lack of agency, connect and control users generally do not have on social media platforms.

29. <https://static1.squarespace.com/static/65c4c457ea98cb3bb89057c0/t/67007ebcc533093e/be529759/1728085692920/AD+Final+Resolution.pdf>

30. <https://peoplevsbig.tech/briefing-protecting-children-and-young-people-from-addictive-design/>

31. https://5rightsfoundation.com/wp-content/uploads/2024/08/5rights-DisruptedChildhood_G.pdf

32. <https://aasm.org/are-you-tiktok-tired-93-of-gen-z-admit-to-staying-up-past-their-bedtime-due-to-social-media/#:~:text=Prioritizing%20social%20media%20over%20sleep,or%20participating%20in%20social%20media.>

33. <https://www.sciencedirect.com/science/article/abs/pii/S0747563218300955?via=ihub>

34. <https://www.sciencedirect.com/science/article/abs/pii/S0747563223001036>

35. <https://dl.acm.org/doi/10.1145/3411764.3445610>

36. <https://www.sciencedirect.com/science/article/pii/S0164121222001935?ref=pdf-download&fr=RR-2&rr=92a80cd98b4cec24>

37. <https://www.apa.org/topics/social-media-internet/youth-social-media-2024#:~:text=Infinite%20scroll%20is,social%20media,xiv>

Research Methodology

This study and recommendations were formulated in three parts:

- 1) We conducted a landscape analysis from academic and civil society papers in human computer interaction (often referred to as HCI), psychiatry and technology. To create this foundational analysis, we cast a wide net of academic papers and gray papers to include in our research across the domains of digital addiction, social media addiction^{29 30 31 32 33 34}, harmful design patterns (often called deceptive design, dark patterns³⁵ or manipulative design), pervasive design³⁶, and how a wide variety of technology and online behaviors (including social media use and gaming) negatively impacts both children and adults³⁷.
- 2) We conducted **12 qualitative interviews with policy, technology, design and psychiatry experts** working across healthcare, academia, technology, and civil society.

Interviewee	Position
Andres-Roman-Urrestarazu	Mental Health, Policy, Economics Group Leader Assistant Research Professor - Department of Psychiatry, University of Cambridge Visiting Professor - Sección de Psiquiatría del Niño y del Adolescente, Pontificia Universidad Católica de Chile Senior Harkness Fellow in Health Care Policy and Practice Affiliate Researcher Bennett Institute for Public Policy - University of Cambridge Lancet Commission Lead on Health Systems and Problematic Use of the Internet
Itxaso Domínguez de Olazábal	Policy advisor, European Digital Rights (EDRi)
Baroness Beeban Kidron	Baroness Kidron sits as a crossbench peer in the UK’s House of Lords. She is an advisor to the Institute for Ethics in AI, University of Oxford, a Commissioner on the UN Broadband Commission for Sustainable Development, an expert advisor for the UN Secretary-General’s High-Level Advisory Body on Artificial Intelligence, and Founder of 5Rights Foundation. She is a Visiting Professor of Practice at the London School of Economics, where she chairs the research centre Digital Futures for Children, and a Fellow in the Department of Computer Science, University of Oxford.
Professor Marc Potenza	Professor of Psychiatry, Child Study and Neurobiology at the Yale University School of Medicine, Director of the Problem Gambling Clinic and the Center of Excellence in Gambling Research. Director of the Women and Addictive Disorders Core of Women’s Health Research and the Program for Research on Impulsivity and Impulse Control Disorders, both at Yale University.

Interviewee	Position
Becket Le Claire	Head of Compliance, 5rights Foundation
Dr Cristiana Santos	Assistant Professor in Law and Technology, Utrecht University
Dr Kaitlyn Regehr	Associate Professor and the Programme Director of Digital Humanities in the Department of Information Studies. University College London.
Dr Jennifer King	Privacy and Data Policy Fellow at the Stanford University Institute for Human-Centered Artificial Intelligence.
Leah Reich	Former user researcher, Instagram
Maryant Fernández	Former Head of Digital Policy BEUC, the European Consumer Organisation
Professor Shane Thomas	Distinguished Professor of Federation University, Specialist Advisor to the Vice-Chancellor, Health Professor of Health Promotion
Dr Richard Graham	Consultant Child & Adolescent Psychiatrist and Clinical Director at stem4, former Clinical Director at the Tavistock Clinic and at Good Thinking: London's Digital Mental Wellbeing Service.

- 3) We hosted an interactive workshop with stakeholders from government, regulators, healthcare and policy to receive insights on preliminary findings.

Landscape Analysis and Findings

In this research, we explore: what is a robust definition of digital addiction? What are the elements and components of digital addiction for social media? Then, within digital addiction, what are elements of addictive design that have been utilised by social media to facilitate digital addiction? Primarily, this work focuses on digital addiction, and addictive design, and its relationships to one another, and how these two types of phenomena intersect particularly in social media to facilitate social media addiction.

Why we cannot diagnose 'Digital Addiction'/'

'Problematic internet Use

At present Digital Addiction/problematic internet use is not a recognised mental health condition. In order for a condition to be considered psychiatric diagnosis where the impacted person would have access to care and support, that mental health condition would need to be included in an official diagnostic manual listing the traits or symptoms of the disorder based on evidence based research. For a condition, like digital addiction, to be considered for the DSM-V or ICD-11, there is a long, rigorous process involving evidence based reviews, working groups, field trials and global consultation. This process can take many years and one that is considerably longer in comparison to the invention of new technologies and how quickly those technologies are rolled out in society. However, problematic internet usage and digital addiction are being studied within the psychiatric field. There are a number of academic papers that reference social media addiction or other commonly used terms for conditions related to excessive use of the Internet with signs and symptoms of dependence syndrome, which can be seen in Fig 1.

38. 1. Liu T, Potenza MN. Problematic Internet Use: Clinical Aspects. In: Aboujaoude E, Koran LM, eds. *Impulse Control Disorders*. Cambridge University Press; 2010:167-181.
39. Achab, Sophia & Meuli, Vania & Deleuze, Jory & Thorens, Gabriel & Rothen, Stephane & Khazaal, Yasser & Zullino, Daniele & Billieux, Joel. (2015). Challenges and trends of identification and treatment of disorders associated with problematic use of Internet. WHO offset publication.

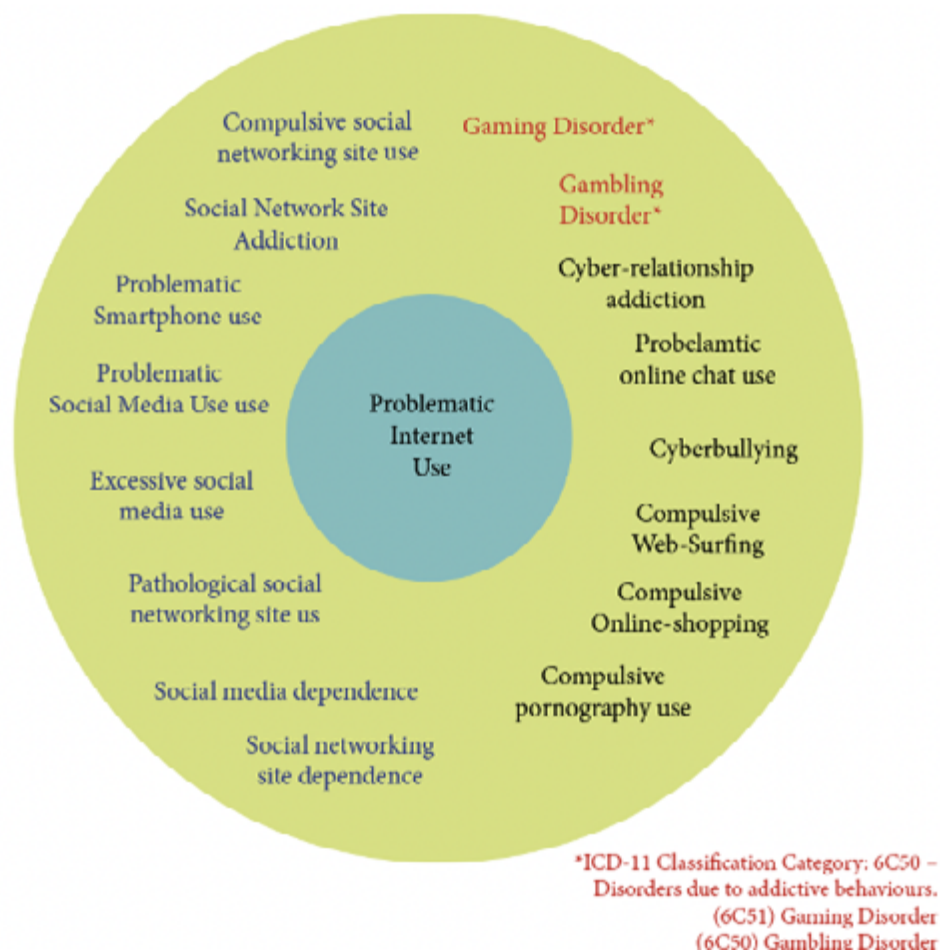


Fig. 1 terms related to excessive use of the internet, which can be encompassed under the umbrella term of Problematic Internet use.

‘Problematic Internet Use’ is now being used by World Health Organisation working groups and the research community, as an umbrella term encompassing a range of problematic online activities. Problematic Internet Use can be defined as ‘uncontrolled use of the internet that leads to significant psychosocial and functional impairments; one could argue that ‘digital addiction’ of social media would fall into this umbrella term’³⁸.

For policy guidance and recommendations, one could use the term ‘problematic internet use’ in lieu of ‘digital addiction’ as a psychological description. However some researchers have argued that it makes ‘no sense to consider problematic internet use as a single entity with a single clinical expression’ given the wide variety of online activities and the behaviors it could include.³⁹

We interviewed Professor Marc Potenza, a prominent psychiatrist who has been researching problematic internet use and who has

40. Internet Addiction: A Brief Summary of Research and Practice, 2012.

41. <https://www.who.int/standards/classifications/frequently-asked-questions/gaming-disorder>

been present at the World Health Organisation working groups on Problematic internet use. He described that *‘during initial meetings regarding problematic internet use, most of the data at the time related to excessive gaming. The group heard stories about deaths in internet cafes in Asia and parents leaving children unattended in cars while they were gaming. And as such significant concern was raised and that provisional diagnostic criteria should be developed.’* There continues to be a World Health Organisation working group on problematic uses of the internet. However, there is no timeline on when Problematic internet use may or may not be considered for inclusion in diagnostic manuals.

Research has implicated social media use in increased rates of depression, self reported anxiety, insomnia and overall poor day to day functioning. ‘Internet use may also lead specifically to dopamine release in the nucleus accumbens, one of the reward structures of the brain specifically involved in other addictions.’⁴⁰ Relatedly, the medical discourse regarding social media addiction remains unclear, those who feel that they have problems cannot access help given the lack of diagnosis criteria as “almost everyone with these disorders is untreated and we don’t seem to have credible plans to fix that problem,” Prof Shane Thomas (Professor of health promotion and behavioral addiction expert) mentioned in an interview for this paper.

Gaming Disorder- the first Internet related diagnosis:

The first internet-related disorder to be included in the International Classification of Diseases is ‘Gaming disorder’, a diagnosable mental health condition. Gaming disorder is characterised by a pattern of gaming behaviour (digital or video gaming) where someone experiences impaired control over gaming, the behaviour pattern must be severe enough that it results in significant impairment to a person’s functioning in personal, family, social, educational, occupational or other important areas, and would normally have been evident for at least 12 months.⁴¹

- Preoccupation with gaming
- Withdrawal symptoms when gaming is taken away or not possible (sadness, anxiety, irritability)
- Tolerance, the need to spend more time gaming to satisfy the urge
- Inability to reduce playing, unsuccessful attempts to quit gaming
- Giving up other activities, loss of interest in previously enjoyed activities due to gaming
- Continuing to game despite problems
- Deceiving family members or others about the amount of time spent on gaming
- The use of gaming to relieve negative moods, such as guilt or hopelessness
- Risk, having jeopardized or lost a job or relationship due to gaming

DSM- proposed symptoms of internet gaming disorder

Adapted versions of the Gaming disorder diagnostic criteria (box 1) have been proposed for diagnosis of problematic internet use. For example, by replacing the term 'Gaming' in the above criteria with 'social media' as an example, one can begin to imagine a set of diagnostic criteria. For example, changing preoccupation with gaming to 'preoccupation to social media' or 'giving up other activities, loss of interests in previously enjoyed activities due to social media', illustrates some of the present issues some users already have with social media. However, it's important to emphasise that creating one new form of diagnostic criteria is not as simple as changing a word in a pre-existing set of criteria; this new diagnostic criteria would then need to be validated to ensure it truly captures those with problematic usage, and can be used in a clinical setting.

Many of the clinicians interviewed informed us that they feel that

- 'Problematic internet use is a public health concern',
- '[It's a] 'public health crisis'.
- While 'being mindful that we don't want to overly pathologise behaviours that people engage in in non-problematic ways.'

43. World Health Organization (2015). Public health implications of excessive use of the internet, computers, smartphones and similar electronic devices: meeting report, Main Meeting Hall, Foundation for Promotion of Cancer Research, National Cancer Research Centre, Tokyo, Japan, 27-29 August 2014. World Health Organization. <https://iris.who.int/handle/10665/184264>

44. Problematic Internet Usage

45. World Health Organization (2015). Public health implications of excessive use of the internet, computers, smartphones and similar electronic devices: meeting report, Main Meeting Hall, Foundation for Promotion of Cancer Research, National Cancer Research Centre, Tokyo, Japan, 27-29 August 2014. World Health Organization. <https://iris.who.int/handle/10665/184264>

It's important to contextualize the clinician's statement with the note that the World Health Organisation has considered excessive smartphone use as a public health concern since 2015.⁴³

How can a clear definition of online addiction be formulated?

We hypothesize that it is likely that the best solution will be to have an umbrella term such as 'problematic internet usage'⁴⁴ with ability for sub categorisations that can adapt rapidly, such as problematic online shopping, problematic AI companion use, social media addiction and whatever new types that appear in the future. There is a need for faster and more responsive adoption of new presentations, while understanding that pathologising human behaviors can have consequences, not only to the person, but to health care systems to provide interventions. Regardless as to whether internet use disorder is eventually considered as mental and behavioural disorder or not, the currently available evidence and information indicate that excessive use of internet and related modern technologies may result in health conditions which are similar to substance use disorders in their phenomenology, clinical course and neurobiological basis, which has important public health and public policy implications.⁴⁵

As such, we cannot wait on digital addiction to be a recognised mental health diagnosis, before interventions can occur at a policy level, at a design level, at a product level. Presently, we are already seeing harmful outcomes from what could be described as problematic usage of social media, which is why creating policy now is important to help combat those harms and protect consumers. Psychiatric diagnosis is not the only condition for regulation, and despite the lack of clear definitions for digital addiction in psychiatry, the law is a way to regulate our society and protect human rights.

When Design Goes Wrong: Looking at Addictive Design, Harmful Design, Manipulative Design, Damaging Design, Deceptive Design and Dark Patterns

To more thoroughly understand aspects of digital addiction, and how design is a part of facilitating social media addiction, our research also needed to focus on design, and technology related research. Throughout our human computer interaction focused research, we found different instances of 'addiction' or 'digital addiction' being referenced in relationship to or as part of harmful design, or dark patterns. Design is an expertise and an integral part of technology;

46. https://www.bitsoffreedom.nl/wp-content/uploads/2025/06/20250616-report-exploratory_study_manipulative_design.pdf
47. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>
48. <https://arxiv.org/pdf/2309.09640>
49. https://www.bitsoffreedom.nl/wp-content/uploads/2025/06/20250616-report-exploratory_study_manipulative_design.pdf
50. <https://www.tandfonline.com/doi/full/10.1080/13600834.2025.2461958#d1e156>
51. Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act) [2022] OJ L 277/1, recital 67.
52. <https://arxiv.org/pdf/2309.09640>
53. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>

thus, when writing technology focused policy, it is necessary to rely on academic and civil society research that explores, documents and verifies design based or design influenced harms.

This focus on design is necessary when identifying, understanding taxonomizing and documenting problematic technology use, including digital addiction and social media addiction, because technology and the Internet are designed spaces. Facebook is a designed space, as is Wikipedia, Mastodon, YouTube, Reddit, TikTok, and any piece of software, hardware, digital website, digital platform or ecosystem. Something as minimal as a terminal window to write code is still a designed space. How a consumer reads content, shares content, and comments on that content on social media is designed. Everything a consumer can do in technology, be it software or hardware, has to be ‘designed.’

If the product, platform or mobile phone is what the consumer is addicted to, then in some way, shape or form, the design of that product will be a part of that addiction. Many of the interface elements or product tooling described in the literature on addictive design, are also elements of *attention capture damaging design*, which is a subcategory of dark patterns or manipulative design patterns, a type of harmful design that impacts consumers. However, not all types of addictive design elements could be categorized into manipulative design patterns^{46 47 48} (often called dark patterns, deceptive design or harmful design). What makes addictive design elements addictive is that multiple of these elements are occurring together (e.g. endless scroll, showing content users want to see, recommendation algorithms, etc); whereas a single manipulative design pattern can occur ‘alone’ or occur once and still be a manipulative design pattern. Additionally, some elements of addictive design can include pro-social or pro-user design, like social network ties and social identification⁴⁹, which would not be classified as deceptive or harmful design. Manipulative design patterns are design elements, choice architecture or ‘practices that materially distort or impair, either on purpose or in effect, the ability [of users] to make autonomous and informed choices or decisions^{50 51}’ “in relation to digital systems regardless of the designer’s intent⁵².”

Throughout this paper, for the sake of clarity and to avoid confusion, we will be referring to dark patterns, harmful design patterns or deceptive design patterns as manipulative design patterns. As the authors of this paper, we deeply acknowledge that the term ‘dark patterns’ has harmful origins in equating anything negative with dark⁵³. Given there are so many different terms that can be misinterpreted, or used

54. <https://static1.squarespace.com/static/671c5cac4acff55ddcd96448/t/6720e34efebc5d7d/fc229477/1730208593960/Digital+Fairness+Fitness+Check+Report.pdf>
55. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4899559
56. <https://www.tandfonline.com/doi/pdf/10.1080/13600834.2025.2461958>
57. <https://www.tandfonline.com/doi/pdf/10.1080/13600834.2025.2461958>
58. <https://www.tandfonline.com/doi/pdf/10.1080/13600834.2025.2461958>
59. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4899559

interchangeably, we will be using manipulative design patterns to only refer to design elements, findings, or research that references design that fits under the phenomena of ‘dark patterns.’

Harmful Design and Addictive Design in Context

The European Commission’s Digital Fairness Fitness Check found that in “... digital addiction affects millions of EU consumers. In the public consultation on the Fitness Check, 33% of consumers reported spending too much time or money using certain websites or apps. Likewise, in the consumer survey, 31% of consumers reported spending more time or money than they intended because of specific features such as the autoplay of videos, receiving rewards for continuous use or being penalised for inactivity, whereas 24% had no experience with this type of situation. BEUC’s 2023 survey found that 83% of consumers report spending more time on social media than they intended⁵⁴.” The Digital Fairness Fitness Check, mentioned by many of our interviewees, illustrates the wide impact of harms of manipulative design patterns and addictive design, especially when these two harms overlap with similar designs and how these two types of harmful design impact a user’s autonomy and agency within technology.

Manipulative Design Patterns’ Impacts in Relation to Addiction

Below are different ways of how manipulative design patterns patterns that impact or facilitate addiction:

- **Loss of autonomy:** the paper Which Online Platforms and Dark Patterns Should Be Regulated under Article 25 of the DSA?⁵⁵ and No Harm No foul: how harms caused by dark patterns are conceptualised and tackled under EU data protection, consumer and competition laws,⁵⁶ both list loss of autonomy as a harm of manipulative design patterns (e.g. dark patterns).
- **Addiction can be an outcome of manipulative design patterns:** from elements such as infinite scroll or autoplay⁵⁷
- **Addiction includes a combination of factors:** “Addiction as the result of the combination and interaction of dark patterns with personalisation (especially for targeted advertising) and recommender systems”⁵⁸ and this combination of factors is also seen in other addictive design literature
- **Loss of time:** multiple papers, including the Digital Fairness Fitness Check, mention users losing a sense of time as an outcome of addiction and manipulative design patterns⁵⁹
- Addiction and manipulative design patterns can make

60. <https://www.tandfonline.com/doi/pdf/10.1080/13600834.2025.2461958>
61. <https://arxiv.org/pdf/2101.04843>
62. <https://doi.org/10.4018/JGIM.322778>
63. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6679162/>

consumers vulnerable: addiction and manipulative design patterns can cause “[a] lack of self-control and self-determination, and waste of time. Addiction is indicated as a factor that turns an average consumer into a vulnerable one, which is especially relevant for consumer protection.”⁶⁰

How Addictive Design Differs from Manipulative Design Patterns

What makes addictive design different from other types of harmful design is that addictive design elements must have multiple elements occurring together to facilitate addiction. Unlike manipulative design patterns in which a product can have one instance of a manipulative design pattern or many; the amount of manipulative design patterns present in a product does not impact if a manipulative design pattern exists or not. The most privacy preserving and GDPR respecting website can still have a manipulative design pattern if that website makes it difficult to unsubscribe. Manipulative design patterns have other types of harms including increasing cognitive burden, financial loss and privacy loss.⁶¹

Some elements of addictive design include a variety of pro-user design, or design that can be as positive elements, such as showing users what they like, building out community via social network ties and social identification⁶², and making it easier to connect with friends.⁶³ Some of these same positive suggestions can be transformed into harmful elements as well; if the content a user wants to see is pro-anorexia content, or if making it easier to connect with friends results in Facebook suggesting someone’s bully as a friend to connect with. Depending upon what the content is, or emotional or mental state of the user, design elements that facilitate addiction can be positive or negative. However, part of what can make a social network addictive will be elements like users having a community and a community that they will want to interact with. But, having a community is not enough to make the product addictive. It’s a variety of addictive design features together that facilitate digital addiction like social pressure, social capital, endless scrolls, temporal events or FOMO, and others. **This combination of multiple factors might make it more difficult to regulate, given that some of these factors, like FOMO, do not manifest just via the design, but also from the feelings a user has about the content or their community.**

Since manipulative design patterns are a specific type of harmful design that are different from addictive design, addictive design requires new types of regulation to mitigate and combat, something that one of our other interviewed experts pointed out. “The value of focusing on addictive design is that it allows us to show why existing rules are not enough. Even where certain patterns resemble issues addressed under Article 25 of the DSA, addictive design operates through broader system logic and optimisation goals that fall outside its scope. This is precisely why new regulation, and in particular the Digital Fairness Act, is needed alongside existing frameworks like the DSA,” said Itxaso Domínguez of EDRi. But it might be hard for consumers to understand how they are different or even that they are considered harmful by regulators. “Many of the dark patterns and addictions are not obvious. Even when people are somewhat aware they don’t know how to deal with them, or they may think they’re legal. They don’t really even wonder what they can do about it,” Maryant Fernández, formerly the head of digital policy at BEUC, mentioned in an interview.

Part of what makes addictive design different is also considering the threshold of ‘addiction’ that might have to be met to prove or properly identify the type of problematic internet use or digital addiction related harm a consumer is facing. If a consumer is being harmed by social media and addictive design, is there a threshold to meet? Furthermore, does there need to be a delineation between different types of harmful design, e.g. manipulative design patterns and addictive design, and does that difference matter in both policy, and for that user to seek psychiatric support? Fernandez, an expert in consumer safety and on manipulative design patterns (dark patterns), explained, “The delineation between addiction and dark patterns, I think, is not very clear, certainly not to me, and how to differentiate them, and whether it’s enough to have requirements without actually proving a proper addiction, because that’s when the bar is very high.” For the most impactful regulation, we need to have these questions answered.

What is Addictive Design and What Design Means For Policy

Part of the thorniness of addictive design is understanding how design, as a term, has a multitude of meanings and can be used in different ways when describing building and creating a product, including a social network. Designing something as comprehensive as a social network has design taking on many meanings, and it will include product design (graphical, visual design of the social network), user experience design (the architectural layout and infrastructural design of the social network), copywriting/UX writing (how things are named and described within the social network), communication design

64. Compiled from a variety of papers that focused explicitly on addiction and design elements, including: Whatsapp and wellbeing; a study on whatsapp usage, communication quality and stress <https://dl.acm.org/doi/10.14236/ewic/HCI2017.85>; I-Cheng Chang and Chuang-Chun Liu. 2023. Are People Addicted to Social Networks? J. Glob. Inf. Manage. 31, 1 (Feb 2023), 1–23. <https://doi.org/10.4018/JGIM.322778>; People vs Big Tech's Briefing: protecting children and young people from addictive design <https://peoplevsbig.tech/briefing-protecting-children-and-young-people-from-addictive-design/>; 5rights Pathways: how digital design puts children at risk <https://5rightsfoundation.com/wp-content/uploads/2021/09/Pathways-how-digital-design-puts-children-at-risk.pdf> and <https://pmc.ncbi.nlm.nih.gov/articles/PMC6679162/>
65. <https://www.cignaglobal.com/blog/body-mind/getting-into-a-flow-state-of-mind>
66. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6679162/pdf/ijerph-16-02612.pdf>
67. Blohm, I., Leimeister, J.M. Gamification. Bus Inf Syst Eng 5, 275–278 (2013). <https://doi.org/10.1007/s12599-013-0273-5>

and communication theory (how the social network can facilitate communities forming). The elements that have been identified to make up addictive design are as expansive, with design embodying this myriad of meanings. A social media's comment box is the visual or UX/UI space that allows for a conversation to start, but it's the people on the social network and how they are able to form relationships that is the communication design. Facebook cannot create the community but it can provide the space for the communities to organize, find each other, and interact with one another.

From our research and key papers, we have compiled a list of features, design principles, and types of design that can potentially facilitate addiction:⁶⁴

1. **Endless Scrolling/Infinite Scroll/Endless Streaming/Autoplay:** automatically showing the next piece of content to provide a continuous, endless feed, makes it difficult to find a natural stopping point.
2. **Flow state or tunneling:** flow state is a positive mental state experienced when you're completely absorbed, focused, and involved in an activity. Time passes without you noticing and you're free from distraction, boredom and self-consciousness⁶⁵.
3. **Endowment Effect/ Mere Exposure Effect:** "every time players visit the app platform and invest more time in the construction of the virtual world, it will get harder for them to detach from the game or even delete the app. The endowment effect might be both explained by ownership and loss aversion. Also, of importance is the mere exposure effect describing that the more often you are exposed to a certain (neutral) thing or application (here a game), the more you like it."⁶⁶
4. **Show Users What They Like:** this is in reference to content, friends, etc.
5. **Social Pressure:** such as blue ticks/ nudges/default settings. This system design of apps nudges a person to behave in a certain direction.
6. **Temporal Events/ FoMo:** Content only available for a set time/ Fear of Missing Out.
7. **Social Rewards:** refers to design elements such as likes, user comments, and general engagement.
8. **Gamification:** Gamification is defined as the use of game-design elements and incentives combined with desired behaviors in order to positively influence user motivation, behavior of users, and adherence⁶⁷

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9. **Notifications:** such as “likes”. Both the novelty and validation of another user’s engagement triggers a dopamine release reinforcing the desire to post and interact creating a “social validation feedback loop”.
 10. **Hyper personalised content algorithms or “recommender systems”:** Brain scans of students showed that watching a personalised selection of videos triggered stronger activity in addiction-related areas of the brain compared to non-personalised videos.
 11. **Intermittent-reinforcement:** meaning users receive content they find less interesting punctuated by frequent dopamine hits from likes or a video they really like. This keeps the user scrolling in anticipation for the next dopamine reward. This randomisation of rewards has been compared to “fruit machines” in gambling.
 12. **Social Capital:** resources embedded in interdisciplinary personal relationships that support the development of social communities. It is an elastic construct used to describe the benefits of relationships with others. The concept of social capital began with the formation of trust within social communities and human interactions. Social capital is a pool of resources that can be harnessed through social connections embedded in social networks . SNS enables people to display themselves, express their social network, and develop relationships with others.
 13. **Social Network Ties:** shared language, goals or interests in a community.
 14. **Social identification:** sense of belonging or membership.
 15. **Stickiness:** why a user repeatedly will return to a platform, and that stickiness are positive forms that can then contribute to addiction. Stickiness is: the frequency, depth, and duration of site visits. Website stickiness is associated with attraction, conversion, and retention.
 16. **Quantifying and displaying popularity:** where visual elements, such as follower counts, likes, or how much the content has been shared, quantify and display the popularity of the content or user.
 17. **Making it easy to share:** where an app makes it very prominent in the design and very easy to be able to share any kind of information or content.
 18. **Offering In-app or in-game purchases:** this is where an app (or a game) offers or upsells extra features to, often, enhance the experience for users, and these extra features cost money.
 19. **Making it easy to connect, with friend or follower suggestions:** the ease of being able to connect is key. Making it easy to engage in social network ties, find friends, and be able to ‘friend’ or follower profiles.

68. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>
69. https://www.bitsoffreedom.nl/wp-content/uploads/2025/06/20250616-report-exploratory_study_manipulative_design.pdf

Not all elements of addictive design, as illustrated above, are negative or harmful. Having a community and friends on a social network is a positive attribute to a social network, and it's why users stay on social networks, and use social networks as communication tools with their friends. Similarly to showing users what they like or having notifications, those can be positive attributes and helpful design elements for wayfinding, organizing information, and finding pertinent information to the user. It's how these elements are deployed that can make them harmful. The authors of "*Defining and Identifying Attention Capture Deceptive Designs in Digital Interfaces*"⁶⁸ found similar issues with the visual design and architecture found in some manipulative design patterns. The context of how that particular design is deployed deeply matters if that design element is a dark pattern or not. They explained that "a universal challenge for damaging patterns is that not all patterns are harmful all of the time. For instance, Brignull describes how an interface element like "opt-out defaults" (a checkbox or radio button that is pre-selected for the user) might be ethical in one context, but not in another." In the context of addictive design, it's not clear if it's possible to add such granularity or changes that the manipulative design patterns example was able to do. If 'pro-social content' like conversations with friends, can be one small component of many that leads to digital addiction and is a part of addictive design, it becomes very difficult to then regulate that element of addictive design. This then raises the question of how to understand these elements together and separately, and what elements should be regulated and what should not.

Lastly, one has to consider the role of a 'neutral' design element, such as a notification, that could potentially facilitate digital addiction. Some notifications can become manipulative design patterns, like ones found on Snapchat that 'recapture attention' and notify users of a comment on a video but not a video that the user has posted⁶⁹, which abuses what a notification is. This duality of notifications, with the 'recapture attention' dark pattern and the neutral notification of 'someone commented on your content' both bring users back to the platform. In bringing users to the platform, this creates the opportunity for addictive design elements like social network ties (seeing friends) or seeing content a user likes, which then contributes to other forms of addictive design, such as stickiness and the mere exposure effect. It's important for policymakers to consider how 'neutral' design, like a notification a user has set, can accidentally create an opportunity for addictive design to hook a user.

70. <https://iris.who.int/handle/10665/184264>

71. https://www.europarl.europa.eu/doceo/document/A-9-2023-0340_EN.html

72. <https://www.tandfonline.com/doi/pdf/10.1080/13600834.2025.2461958>

Conclusion: Next steps and recommendations

As the World Health Organisation states: ‘Prevention is better than cure’. In other words, ‘scientific uncertainty should not be used as a reason to postpone preventive measures’.⁷⁰ Even if problematic internet usage, and digital addiction are not officially considered mental health disorders, there is a plethora of research that does support consumers are being negatively impacted by social media, and it’s impacting their mental health, autonomy and agency. Now is the time to think deeply and critically about how to combat digital addiction, and the role addictive design plays in harming consumers across the EU, and create impactful regulations to mitigate harm against consumers, and protect consumers’ mental health, autonomy, and agency.

1) More research is needed across the board, focusing on addictive design, and interdisciplinary research

- More research is needed to understand the nuances, harms, and how these harms manifest in digital addiction and addictive design, and this is something that the European Parliament’s report on addictive design of online services and consumer protection in the EU single market also advocates for as well⁷¹.
- This includes more interdisciplinary research on how psychiatry, human computer interaction (design) and policy can work together to create actionable insights and useful, verifiable research⁷² for digital addiction and addictive design to further inform policy and create actionable regulation as soon as possible.
- More research into addictive design is deeply needed. Consumers, regulators, psychiatrists, designers and technologists need to understand how addictive design elements work together. As stated earlier we need more research to understand how the combination of addictive design features ‘fits’ together, as some of addictive design features, showing users the content they like, might be incredibly difficult or impossible to regulate. Especially since some of these features, like showing content that users like, do not manifest just via the design, but also from the feelings a user has about the content or their community.
 - How many of the addictive design elements together can facilitate addiction? Is it one element, two elements, five elements or all, and how does it differ between different types of users across a wide spectrum from those that

73. <https://www.tandfonline.com/doi/pdf/10.1080/13600834.2025.2461958>

74. https://www.europarl.europa.eu/doceo/document/A-9-2023-0340_EN.html

simply do not like how they use social media to those that have much more problematic usages of social media? These questions need to be answered to inform policy and regulation and help create nuanced support plans for impacted consumers facing digital addiction.

- Support research that allows researchers to better develop metrics to measure harm, and create tools to assess meaningful platform usage, to help distinguish between meaningful engagement and addictive engagement.⁷³

2) Focusing on Autonomy and Consent in Regulation

There needs to be more research and focus on strengthening autonomy, agency and consent in regulation for consumers. In regards to this, what are the thresholds and burdens of proof for civil society, impacted users and clinicians when autonomy is subverted and a user is harmed? How can we ensure that users and their autonomy and agency are protected while not creating problematic or ill-defined regulation, especially in regards to design and technology?

- *“There should be adequate regulation that includes taxation to support research and help for people who develop problems. There should be more transparency. Governments can say that we need to make data available for people to understand the public health impacts.”* Professor Marc Potenza

3) Forcing Platforms to enact pro user design choices now

Regulation could be passed that centers all user agency and autonomy by ensuring that attention capture and harmful features can be turned off, and turning those features off by default, and enabling pro user and pro-privacy design choices, and ensuring those features are easy to access, are usable and accessible.

- The above can be achieved by having platforms enact pro-user choices like ‘**right to not be disturbed**’ which “empower[s] consumers by turning all attention-seeking features off by design and allowing users to choose to activate these features by simple and easily accessible means, possibly with an attached mandatory warning of the potential dangers of activating these opt-in features, offering consumers real choice and autonomy without burdening them with an information overload⁷⁴.” This would include allowing users to turn off autoplay, endless scroll and many of the manipulative design patterns and addictive design features mentioned within this paper.
- Creating pro-privacy design that is turned on by default so a

75. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>
76. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>
77. <https://dl.acm.org/doi/full/10.1145/3544548.3580729>

user's data and interests cannot be used against them to target their attention.

- Ensuring all features, but especially pro user features like 'the right to not be distributed' are accessible for disabled users, usable, and easy to find.
- Allow options for users to 'customize or disable features that they find distracting⁷⁵.' This would extend to all different types of features, not just attention capture.
- Allow users to see an estimated time of viewing new content, so users can make more informed decisions about their content viewing. "For example, the top of each blog post on the site Medium displays an estimated read time. This design contrasts with the Time Fog pattern, which purposefully obscures any indicator of the passage of time."⁷⁶
- Ensure that content advertisements, promoted posts, sponsored content and paid promotions can easily be identified from other content, and that proper transparency around this sponsored content can be accessed by users. Additionally, make it easier for users to ignore or reject this sponsored content⁷⁷.

4) Understand that this is a problem that impacts users in many different ways

There is no one size fits all solution here, particularly in regards to digital addiction and addictive design. Different users will have different types of responses to addictive design elements. Some might find that the design elements lead to problematic use and then need support to find ways to mitigate these potential addictions. While, others may have periods of problematic or harmful use interspersed with periods of healthy use. Addiction is often assessed in a biological, psychological and social model, with each person having a unique set of circumstances or vulnerabilities that may lead them to the addictive use.

5) Understand that tackling this problem means funding mental health research in this area, and clinics to support people presenting in distress.

Those impacted need help now, and there needs to be funding to create clinics and support for those suffering from digital addiction. It's important for policymakers to understand that there are not ways for all impacted users across the European Union to seek mental health support for problematic internet use, but there should be. Users need support and that support needs to be available and accessible right now, in the present, and in the future. As Professor Shane Thomas stated in our interview, '*It is not just a research issue, it is an issue of how you can make treatment available to people in an insured and or government subsidised manner.*'

Overall, when social media addiction is recognised as a diagnosable mental health condition, this will have significant consequences on the impacted populations, as there will need to be services equipped to support those affected, including creating evidence based therapies. Whether digital addiction is recognised as a mental health concern or not, there is an important public health approach needed to prevent the negative consequences of social media addiction now. This is where creating nuanced policy to address addictive design is important, alongside starting to invest in mental health support for those that do have problematic internet or social media usage. By investing in care now, investing in more research in digital addiction and addictive design, and implementing pro-user design considerations, technology can be remade to potentially mitigate addictive design harms. Lastly, we urge policymakers to consider emphasizing how a duty of care is needed from the technology companies towards their users to not cause harm. As Professor Shane Thomas said during our interviews, *“We cannot afford to take the 10-to-20-year process [that] has been in play for gambling and gaming with these new addictions. It is too urgent to have these incredibly lengthy delays.”*