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## **Dreaming of seamless interfaces: Media and friction from the feuilleton to personal computing**

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### **Abstract**

In human-computer interaction, the notion of “seamless interface” describes a smooth interactive system that eliminates any possibility of friction between users and digital devices or platforms. Although interface designers have developed sophisticated technologies and strategies to pursue this aspiration, a frictionless user experience remains an ideal but ultimately impossible goal. Relying on the critical exploration of a series of historical case studies - the emergence of the feuilleton or serialized novel in the nineteenth century, the development of TV scheduling in the second half of the twentieth century, and the rise of the personal computer industry in the 1980s -, this article contextualizes this ideal within a wider historical trajectory. Through an in-depth exploration of these three cases, we show how the dream of building a seamless relationship between media and readers, viewers or users remained ultimately unattainable due to the inherent frictions that remain between these two sides. The gap between the aspiration and the actual experiences of interacting with media foregrounded the emergence of feelings of ambivalence, conceived as an intrinsic component of people’s engagement with media. The longer history of media frictions provides a useful entry point to the contemporary digital landscapes, where the ubiquity of digital platforms goes hand in hand with a feeling of deep ambivalence from users, as the growing public concerns about the social costs of digital connection demonstrate.

## **Dreaming of seamless interfaces: Media and friction from the feuilleton to personal computing**

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In human-computer interaction, the notion of “seamless interaction” corresponds to the dream of a perfect interface that erases any possibility of friction between users and digital platforms (Coyne et al., 2004: 433). This notion, which has shaped industry-led efforts to build user-friendly software and devices (Black, 2022), conflicts however with people’s practical experiences with digital media. If an interface can be described as a place of interaction (Scolari, 2018), this interaction is never completely untroubled. As Galloway (2012) pointed out, an interface always entails a degree of friction. Even the most efficient systems are not entirely transparent, and the smoothest user experiences still implies a level of separation between user and the digital technology. Although interface designers have developed sophisticated technologies and strategies to pursue this aspiration, a frictionless user experience remains therefore an ideal but ultimately impossible goal.

Relying on the critical exploration of three historical case studies - the serialized novel, television broadcasting, and the personal computer - this article contextualises this ideal within a wider historical trajectory, showing that both the dream of frictionless interfaces and the inescapable presence of friction have shaped the history of media technologies since at least the early nineteenth century. The historical case studies mobilized in this article demonstrate that, as new strategies and technologies were developed to maximize user engagement, and in spite of visions that idealised the potential of a seamless form of interaction with media, friction always emerged as a crucial component of this engagement.

The selection of the case studies was meant to maximize breadth with regard to time periods and of media involved. Each case study corresponds to distinct periods of capitalism— industrialization, mediatization, and digitization. Beyond their historical contexts, each study serves as a precursor to contemporary platforms. These platforms act as marketplaces, seamlessly connecting end users/audiences, content producers, and advertisers through deliberate design choices and the use of emotional storytelling, strategically fostering habitual engagement.

The first case, the serialised novel or feuilleton in the nineteenth century, unveils how the success of an apparently “old” medium such as popular literature relied on a range of strategies and tricks aimed at establishing and enhancing the continuity in the consumption of fiction. The second case study, i.e., TV scheduling, provides a powerful illustration of how the institutionalisation of electrical media also depended on the successful development of similar strategies aimed at maximising viewers’ connection to TV channels: scheduling, in this regard, can be considered as a formal and technical mechanism to naturalise the medium, bringing television at the centre of people’s lives. The third case study, the emergence of personal computing, shows how the computer was made into a popular medium through the construction of “user friendliness” as a design approach that aspires to eliminate the distance between users and computer systems. In all three instances, however, the vision of a seamless experience for readers, viewers and users clashed with the actual experiences of engagement with media, with friction emerging as a structural dimension of the interaction.

The article contributes to ongoing debates in three ways. First, it contributes to this special issue by contextualizing more rigorously theories of media resistance and media friction within a longer historical trajectory. This is of crucial importance, since the public debate about digital media tends to overstate the novelty of digital technologies and, even more importantly, of people’s engagement with them. By contextualizing historically the dream of frictionless interaction, we offer a useful corrective to presentist approaches and provide new ground to understand ongoing dynamics in terms of change *as well as* continuity (Balbi & Magaudda, 2018).

Second, our perspective helps reframe the concept of media resistance as something that does not represent an exception but rather a constitutional element of every kind of engagement with media. A wealth of research in media history has shown that the emergence of new media always stimulates hopes about their potential benefits but also fears and preoccupations (e.g. Sturken et al., 2004). Syvertsen underlines how media also attract negative reactions and criticism; she conceptualizes “media resistance” as “an argument linking the existence and functions of media in society with social ills and social change to the worse” (2017: 9). Instead of restricting friction merely as a form of criticism and opposition towards media, however, we are interested here to unveil how a space of friction always exists between users - by which term we refer here not only to computer users but to all media users, including readers and spectators of non-digital media - and the media themselves. Friction is therefore normalised in a relationship that constitutionally entails an element of separation and attrition not only for the case of digital interfaces but more broadly for all media.

Media theory has often highlighted that media play such a substantial role in people's experiences of the world that it becomes virtually impossible to distinguish between humans and the media they employ. As Marshall McLuhan (1964) famously argued, media are extensions of humans; others, such as Mark Deuze (2012), have talked of "media life" to emphasise that media are an integral part of the environment we live in, to the point that we may not always notice their presence or absence. We contend, however, that a degree of friction is not only inevitable but indeed functional to the development of such close patterns of use and interaction with media. In order to profit from the potential that media provide in areas including communication, entertainment, and information, people need to establish not only a relationship with media but also a distance with and from them. To live their media lives, in other words, they also need to maintain a degree of friction from the media themselves. The friction inhabiting the intersection between media and users is evident, for instance, in the way users engage with digital interfaces and platforms from their own social positionality. Because it is impossible to anticipate "seamlessly" how individual users engage with technology, there is always an element of friction that reverberates in the diversity of people's uses and interpretations of the technology, ranging between dominant, oppositional and negotiated decoding (Shaw, 2017; Siles, 2023).

Media resistance, in this sense, is not forcefully negative but also constructive, as its etymology suggests: the word resistance derives from the latin *sistere*, which means "take a stand, stand firm." To profit from the opportunities that media offer us, building a relationship with media without being fully absorbed by them, users need to embrace but also to resist media at the same time; they need to be able to "stand firm," i.e. to remain themselves, even as media become a significant part of their identity and everyday life. This does not mean that they may not feel empowered by digital gadgets and platforms and even embrace them in their everyday lives. Even the most enthusiastic users of smartphones would seek distance from the device in specific situations of their everyday lives, adapting to but, at the same time, to some degree also resisting the affordances of the medium in order to negotiate their own regimes of interaction (Shaw, 2017). It is for this reason that the introduction of media that employ new technical and formal strategies to enhance access and connectivity has always been accompanied, as we will show, by the emergence of a dimension of friction between media and users.

Third, and finally, this article feeds into wider debates about connection and disconnection in the digital age. A lively debate has developed in media studies regarding, on one side, the strategies developed by designers and producers of digital devices and platforms to enhance users' connection - and thereby, a platform's financial gains - and, on the other side, the everyday practices that people adopt to disconnect from these platforms (Karppi, 2018). If all the cases

examined in this article foreground the emergence of a range of metaphors that magnify media's ability to capture the user - absorption in the case of nineteenth-century reading, flow in the case of television, user-friendliness in the case of the personal computer -, friction emerges in all these cases as a constitutional component of the interaction that is established between media and the users. This, ultimately, helps explain the high degree of ambivalence and criticism that all these media also stimulated - even while they were embraced by many as new powerful forms of expression and experience. While approaches to digital disconnection have until now tended to emphasize acts of activism, refusal, or escapism against specific media forms (Hesselberth, 2018; Kaun & Treré, 2018), we believe that an approach that understands disconnection as a structural aspect of people's relationships with media reflects more closely an ambiguity that characterizes, to some degree, not some but all digital media users. Even the most enthusiastic adopters of a digital platform, in fact, need to negotiate a degree of separation between themselves and the platform. Hence, our article shows the impossibility of a completely seamless media life (Deuze, 2012).

### **1. Capturing readers: The serialization of the novel in the nineteenth century**

Among changes in media's cultural forms that brought about significant societal and cultural transformations, the emergence of the feuilleton in France and of the serialized novel in the United Kingdom, the United States and around the world deserves special attention. By the middle of the nineteenth century, many of the most popular and influential novels were serialized for publication in newspapers and magazines (Okker, 2003). Although the phenomenon has mainly been addressed within literary history, it is difficult to overestimate the implications of this change for media and communication dynamics. The new availability of fictional stories contributed to the ascent of the printed press as the first veritable mass medium. As a few media historians perceptively noted, moreover, it made the consumption of fiction for the first time an everyday experience for large numbers of people (Ortoleva, 2018), inaugurated modern media's drive towards seriality (Rothöhler, 2020), and opened reading to new kinds of publics that transcended established gender, race, and class divides (Kittler, 1990). Alongside the development of the popular press, the modernization of postal systems, the invention of the electric telegraph and the introduction of photography, the serialized novel played a key role in the explosive changes that transformed the media system in the first half of the nineteenth century.

As the literary form of the novel had emerged in close association with the book form, its serialization entailed much more than a simple division in segments or chapters. Responding to the need of convincing readers to follow the story from one issue to the next within a periodical

publication, serialization coincided with the development of new conventions aimed to “hook” the reader into the story. In the works of authors such as Walter Scott, Alexandre Dumas and Charles Dickens, among many others, the flow of narrative was reorganized in new periodical rhythms that aimed to make serialized literature more absorbing for readers. Operating within the constraints of serialized publication, feuilletons leveraged a continuous and evolving narrative flow to enthrall audiences across multiple instalments. This literary technique involves the strategic use of hooks, twists, and cliffhangers, ensuring that readers remain eager for the next instalment. Narrative flow in feuilletons served not only as a storytelling device but also as a means of fostering a dynamic relationship between the author and the audience. By maintaining a seamless and intriguing flow, feuilletons created a sense of anticipation, encouraging readers to invest in the unfolding story. This narrative strategy not only reflects the cultural context of its time but also highlights the feuilleton's unique capacity to blend entertainment with social commentary, making it a powerful and influential literary form in the historical evolution of serialized storytelling. Strategies included filling each iteration with meaningful events, activating the apparently divergent mechanisms of repetition and momentum, and stimulating the readers' motivation to seek for more content (Meisel, 1983). Authors adapted to the new format by combining lateral development with progressive movement of the main storyline, so that readers could feel both satisfaction in consuming the individual episode and the interest to follow its continuation in subsequent weeks and months (Meisel, 1983; Pettit, 2020). Moreover, themes such as crime and imposture were made more common, contributing to the emergence of a new literary genre, the sensation novel (Pykett, 2011), which expanded beyond the traditional readership by appealing to a growing middle class public. It is in this context that some of the strategies that are routinely activated by contemporary television series, such as the cliffhanger and the narrative climax, emerged and became established, prompting the birth of seriality as a multimedia narrative device (Oltean, 1993; Rothöhler, 2020).

The serialized novel was linked to the emergence of a new business model in the publishing market. To reach broader readerships, newspapers and periodicals that were opening up to growing mass audiences had to build mechanisms to retain readers (Cronin, 2006). In a general reorganization of the mechanisms of perception of the passage of time, newspapers presented themselves as privileged instruments of a daily flow of news, supported by the new status assigned to novelty - hence the idea, which is taken for granted today but would have been counterintuitive before this turn, that yesterday's newspaper is already so old that it is no longer worth reading. The serialized novel provided ideal content to support newspapers' business

model, since it met the need to develop mechanisms that would convince readers to seek out the latest edition of a periodical to follow the continuation of a story.

The example of the cliffhanger helps us to identify, in the case of the serialized novel, one of the fundamental dynamics that characterizes strategies aimed at maximizing seamless interaction with a medium, be it periodical print, television, as well as digital media. To enhance absorption, a writer, TV producer, or designer must start with a model, or at least a set of assumptions, about how the readers, viewers, and users she or he intends to reach 'work.' For example, designers who developed TikTok's interface know that starting a new video immediately after the end of the previous one is more effective than asking the user to select a new one, because they know (or at least they think they know, since like any kind of cultural assumptions, these are far from immune to bias and error) that it is more difficult to stop a video that has already begun than to refuse to start a new one (Kendall, 2021). In the cliffhanger, the writer who decides to introduce a break in the narrative at a seemingly pivotal moment is breaking a convention, that of plot continuity. This choice is dictated by the writer's expectations about the effect such a suspension may have on readers. The writer 'knows' that it will lead the reader to anticipate, speculate, or even just ponder a particular narrative problem.

In this sense, the cliffhanger is a device designed to "colonize the time spent outside the text" (Poot, 2016), which puts our curiosity about the unfolding of the plot at the service of the periodical press's need to ensure that as many readers as possible will buy the next edition. As Clare Pettitt (2020) shows, seriality stimulated consumers of fiction to adjust their habits to a periodized continuum. The new modality of consumption appealed to growing masses of readers thanks to the development of more stringent mechanisms to capture them into consuming fictional stories. The new literary strategies and formulas that were established by serialized novels enhanced absorption, inviting users to look for the next iteration of the story in subsequent editions of the periodical featuring the novel.

Similarly to the ways contemporary social media have been attracting lively controversy due to their alleged capacity to capture users in addictive ways (Kaun and Treré, 2018), serialized novels also attracted criticism and ambivalent feelings. If on the one side serialization was hailed as a successful business model for print media and as an opportunity for reaching broader masses of readers, it was also dismissed by many as a veritable threat to culture. Commentators pointed to its repetitive character, its poor literary value and style, and the banality of its plot and character (Sylversten, 2017: 19). A veritable moral panic surrounded the widening reach of literature powered by novels' serialization: consumption of these texts, critics objected, promoted vice, subverted cultural standards, and impacted negatively on the readers' minds (Brantlinger,



1998: 2). Some lamented their addictive nature, likening the desire to consume fiction to alcoholism or comparing the reading of feuilletons to the torments of hunger that are rewarded episode after episode without being completely relieved until the actual conclusion of the novel (Wynne, 2001: 4-5). Similarly to how today in the debate about smartphones and social media young people and adolescents are often presented as the only truly passive victims of the power of attraction exerted by digital media (Alter, 2017), specific groups of readers such as women and the working classes were considered more vulnerable to serial literature. Reading was thus associated not with a possibility of elevation but with an intellectual and moral deficit (Miller, 1986).

The idea that the literary device established by the serial novel led to a new capacity of literary texts to “capture” its readers, however, does not help acknowledge more subtle forms of engagement that this entailed. The idea of readers being absorbed by the text, in fact, corresponds to an image of Victorian readership that assigns passivity to the public, much aligned in this with the moral panic of the time. In the Victorian age, in fact, critics tended to agree that reading was becoming a more passive activity, bringing forth a general atrophy of the mind (Gettelman, 2012). In literary history, however, new understandings of the importance to study “the actual readers of the past” (Darnton, 1986: 182) revitalize a new line of scholarship that challenges this view of Victorian readers as passive receivers. Historians of reading have recently pointed to previously disregarded bodies of evidence, including private and public accounts of reading practices, that show how “Victorian readers used books unpredictably, independent of authorial direction, and as a prompt for their own associations and speculations” (Gettelman, 2012: 201). This critical reevaluation demonstrated that Victorian novel reader’s psychology was not as impressionable or accessible as previously suggested. For what concerns serialization, it challenged approaches that understood the reading of Victorian novels as a highly sequential experience. Scholars repositioned serialization not as a device that structured the subjective experience of novel reading, but on the contrary as a form that invited the diverse subjectivities of readers to play with (Gettelman, 2012; Bradbury, 2021; Flint, 2003).

Concerning media theory, this critical interpretation corresponds to the recognition that, notwithstanding the effectiveness of strategies to capture readers, spectators, or users, a medium can never become one with the human who accesses and uses it; in other words, that media can never really be true “extensions” of the human, as McLuhan (1964) famously proposed, and as others including Kittler (1990) applied also to the specific case of reading and print media. For all the literary craft through which authors and publishers sought to capture consumers of serial fiction, a gap remained open between the medium, its strategies to enhance absorption, and the

specific subjectivities of readers (Ablow, 2010). It is within this gap that friction emerges as an irremediable dimension of engagement with media.

Acknowledging the role of friction, in this sense, helps contextualize more effectively the diversity of approaches to reading and the adjustments that the interaction between readers and the text necessarily brings upon. If the affordances of a new literary form set the boundaries for the experience of readers in the context of the series, on the other side, the active and subjective appropriation of the text ensured readers the ability to 'resist' - understood, as noted above, not as an explicit opposition against the serial novel but through its etymology of *sistere* or standing firm, i.e. remaining themselves even while the medium of popular literature becomes an increasingly significant part of their everyday life. In the next section, a similar dynamic will be highlighted for the case of another medium that, since the 1950s, promised to capture the attention of its public and to shape a particular form of experience for its viewers: the television 'flow'.

## **2. Televisual frictions: TV scheduling, the flow metaphor and viewers' lived experiences**

We now take TV scheduling for granted. The fact that programmes are ordered in a temporal sequence, a composition that is regulated by a set of operations seems like the natural way of conceiving programming in traditional television. Yet this was not always the case. With the beginning of scheduled television in 1936, television programming was initially only concerned with filling a few hours each evening, that is the hours now known as prime time (Barra, 2022). Over time, however, air time increased and television began to broadcast during the daytime and late at night, as well as on the weekends. This is when the art and the craft of TV scheduling and programming emerged with the aim of capturing and retaining the audience's attention and absorbing it within the experience of television, in an effort to provide a continuous experience with no interruptions and this eliminate the frictions between single programmes. Scheduling is a complex process which lies at the heart of the medium of television. It entails the difficult task of organising broadcasting in a temporal grid by situating programmes of different genres in larger blocks during days, weeks and months with the aim of attracting and keeping the audience for as much time as possible in front of the television. As Ellis puts it: "if programmes are the building blocks of television, then the schedule is its architecture" (Ellis 2000: 25). The advent of television also marks a pivotal moment in the intersection of media and capitalism, profoundly impacting communication landscapes and economic structures (Williams, 1974). Television's introduction not only revolutionized entertainment consumption, but also catalyzed a symbiotic relationship with capitalism. Through advertising, it became a potent instrument for consumerism, shaping

desires and fuelling economic growth. Moreover, the privatization of television networks and the emergence of cable TV further entrenched its capitalist underpinnings, transforming it into a lucrative industry propelled by profit motives.

The process of scheduling has been closely associated with the term (and metaphor) of the “flow”. This notion established itself as a keyword during the 1970s, emerging as a key idea in cultural studies and serving as a compass for political economy approaches to global television. In his landmark book “Television: Technology and Cultural Form,” Raymond Williams proposed the term “flow” to describe the distinctive nature of television after his experience in North America. As Williams remarks: “In all developed broadcasting systems the characteristic organisation, and therefore the characteristic experience, is one of sequence or flow. This phenomenon of planned flow, is then perhaps the defining characteristic of broadcasting, simultaneously as a technology and as a cultural form.” (Williams, 1974: 80). For him, this notion conveys how television changed the nature and the experience of cultural texts. More specifically, the scholar argued that “the notion of ‘interruption’” was inadequate to describe the new experience of television because “what is being offered is not, in older terms, a programme of discrete units with particular insertions, but a planned flow, in which the true series is not the published sequence of programme items but this sequence transformed by the inclusion of another kind of sequence, so that these sequences together compose the real flow, the real ‘broadcasting.’” (84). While the intervals between the programmes were once filled by some signifier that the signal was still active, they were now filled in by commercial advertisements. Hence, as Buonanno has underlined, “the meaning conveyed by the term ‘flow’ is that television programming, although it is regulated and marked out by the organised programme schedule that classifies the individual content according to its appropriateness for the various viewing times, is not offered to the perception and experience of viewers as a succession of distinct and separate programmes that have precise and identifiable limits” (2010: 30). Inspired by Williams’ reflections, flow has become one of the most powerful and frequently used metaphors to describe the functions and modes of operation of television both in academia and public discourse. Metaphors are important conceptual tools through which we think about our world (Lakoff and Johnson, 1980) and this includes the ways we think about media. As a concept, flow addresses the complex entanglements between television technology (the broadcast signal’s flow), institutional programming terms, and, finally, television textuality and the viewer experience, which are of utmost importance (Buonanno 2010). Yet, the meanings evoked by this metaphor are not all positive, as they also suggest that the impetuous current of images and sounds generated by television remains largely outside of our control, and that we are ultimately vulnerable and cannot

escape its compelling fascination. This metaphor would thus signal a relatively passive audience with little willpower. Spigel and Olsson have noted that this concept has been invoked to try to explain too much about television, risking to obfuscate the different processes that we go through during the act of watching TV (Spigel and Olsson, 20014). The issue, she underlines, is that this notion becomes an umbrella term that prevents us from appreciating the several lived experiences that people have when engaging with television. In fact, we know that specific experiences, context and circumstances shape the ways in which television content is accessed, viewed and processed. For example, Frolova's study (2017) on parenting and television shows how some parents experience flow making a distinction between 'broadcast television in the background' and 'watching television' (Frolova, 2017). Other thinkers (Gripsrud, 1998) have pointed out that flow is not a unique characteristic of TV as it can be applied to other media such as the radio or even newspapers.

A more granular view of the concept of flow has been proposed by Klaus Bruhn Jensen (1995) who has unpacked this notion into three categories. First, Jensen talks about a *channel flow*, that is what every television network does to attract and keep viewers interested for as long as possible. When discussing textual organisation on a macro-level, this category is the one more similar to Williams' original idea. Second, based on all currently accessible content, each viewer is able to construct their own *viewer flow*. Here, like in the original concept, the emphasis is on the individual subjective experience of each spectator and the stress on the audiences' lived experiences of television. Finally, all that is shown on all channels and that is tied to these two other categories is referred to as television's *super flow*. Jensen's distinction has the merit of foregrounding that flow actually refers to rather different activities that are often conflated. Indeed, flow is a broadcast strategy and schedule devised to maximise the viewers attention, but at the same time viewers will develop their own flows, that is their lived experiences of watching television, domesticating TV programmes within their own contexts and schedules and according to their specific needs (Haddon, 2017). This ties directly into the concept of "time-shifting," where users leverage technologies to record and store TV programs for later viewing or listening. Initially manifested through VHS/Betamax recording on video cassette recorders (VCRs), this media practice has evolved into contemporary forms of cloud-based access and storage. Time-shifting empowers viewers with increased control and flexibility. Eliciting concerns of disruption from broadcasters and advertisers, it underscores the persistent presence of resistance and friction throughout television's evolution (Belo et al., 2019). Over the past decades, the emergence of new television technologies including firstly the remote control and the VCR (Ulricchio, 2004) and then the DVD, the DVR, as well as the more recent diffusion of streaming platforms like Netflix,

Prime Video, Hulu, Disney+ and several other subscription-based video-on-demand (SVOD) services (Bury and Li, 2015) has questioned scheduling (and consequently the notion of flow) as a way of organising the TV experience. In this new scenario, “television is acquiring - unevenly, but substantively - a database form” (Lobato, 2018: 241) moving from schedules to catalogues. However, scholars have demonstrated that “contrary to claims that scheduling has become obsolete, analyses show that it continues to be a central craft within the television industry, one responding actively to times of change, revising its tools and developing new ones” (Ihlebaek et al, 2014). Thus even if TV is undergoing a profound transformation, television programming logics persist and are intensified within digital media environments (Van Dijk, 2013b; Thibault, 2015; Cox, 2018; Barra, 2022). The new digital environment where television is inserted has permitted the creation of highly personalised flows which are now “algorithmically customised for each viewer” (Thibault, 2015: 118; Cox 2018). To better understand this dynamic, Cox (2018) has coined the terms “televisable” and “invisible” which define the primary logics of the contemporary flow series. Inspired by Williams’ notion of ‘real’ and ‘declared’ programming as interworking organisational schemes that underpin the experiential dynamic of flow, Cox highlights that among “digital media platforms, contemporary organisational schemas relay possibilities for interacting with media content based on invisible computational processes that configure visible forms, possibilities that feed back into the industrial logics of how and why these processes continually shape their visible dimensions” (2018: 439). We can appreciate this personalised flow also in the possibilities of skipping both the opening and end credits on platforms like Netflix to experience TV series episodes as a continuum flow with no interruptions. These affordances maximise “binge-watching”, that is the practice of watching many episodes of a television series or a programme in sequence that have been popularised by VOD networked platforms.

The history of scheduling and the experience of flow demonstrate that from the production side broadcasting has been organised in ways to attract and keep the audience entertained for as long as possible, in an attempt to generate seamless flows with no interruptions, eliminating the frictions and the separation that exists between producers and consumers of TV content. However, as shown by criticism and re-interpretations of the notion of flow, this has never been possible due to the clashes with the lived experiences of different audiences. Viewers, in fact, create their personal flows according to their own needs, navigating the frictions and the ambivalences that define the complexity of the experience of watching television. Innovations such as the remote control further emphasised the active role played by viewers, reminding us that “television viewing is often oppositional: it is a pleasure that comes from resisting dominant ideologies” (Seiter et al., 1989: 4). This is true also now in the age of digital abundance and

personalised algorithmic flows, since digital media platforms cannot predict nor control completely the audiences' behaviours. Moreover, watching television is now an activity that crosses and merges devices and platforms in ways that allow new forms of agency and that make manifest how frictions between the production and reception sides are a structural characteristic of this medium. Hence, in the case of TV viewing, friction corresponds to the inescapable space generated between, on one side, the TV scheduling and its ideal of the flow and, on the other side, the more flexible and unpredictable practices of reception, appropriation and domestication that characterise actual engagements with the medium.

### **3. Opaque transparency: Personal computers, user friendliness, and the dream of seamless interaction**

If cinema, as Gaudreault & Marion (2005) proposed, was not born once but at least twice, the same applies for the modern computer. The electronic digital computers introduced between the 1940s and the 1950s were voluminous machines owned by big institutions such as military organisations, universities and private companies, and were used to complete calculations that were difficult to handle for humans - early applications including calculating the trajectory of bullets or breaking encrypted communication during WWII (Ceruzzi, 2003). Decades later, between the late 1970s and the 1980s, the computer was literally re-invented as a tool for personal use, opening up for the exceedingly wide range of experiences that this technology informs in people's everyday lives today - from locating information to sharing news and private matters, from entertainment to sociality, from education to work. The story of this reinvention is extremely complex and has been studied and narrated by a wealth of historians (as well as by the PR offices of big tech companies such as Apple, see Natale et al., 2019). For what concerns the aspiration to a seamless interaction with media and the emergence of friction as an inescapable dimension of people's engagement with media, the trajectory that led to the emergence of user friendliness as the leading paradigm in the design of personal computers - and later, of many other digital devices targeted to the everyday users - is particularly helpful.

While early computers were difficult to interact with, and programming them to accomplish specific tasks could even require physical manipulations of their hardware from human operators, in the 1960s and 1970s some early but important developments were made in the creation of more functional human-computer interaction (HCI) systems. This involved a process by which the computing machines were increasingly adapted to the senses and the cognitive dynamics of humans, so that human users could use them more effectively (Natale, 2021: 34-49). In such a foundational moment for HCI, two competing visions emerged on how computers could open up

to more general use of the public. The first vision, advanced for instance by computer scientist and AI pioneer John McCarthy in an article published in the popular magazine *Scientific American*, imagined that computer programming could become as widespread as driving cars (McCarthy, 1966). In such a scenario, users would become more proficient in computer science, adapting to the new technical challenges brought about by these machines. The second vision, exemplified by Anthony G. Oettinger's article in the same issue of *Scientific American*, envisioned a different process by which the levy was not much on the users to become more competent, but rather on the computer to become more accessible. According to this approach, computer scientists should aim to make computers "as easy to use as pen and paper" (Oettinger, 1966: 162). Proponents of the latter vision employed the notion of "transparent computers" in the sense of "easy to employ or to understand."

In the decades that followed, it was the vision of transparent computers - a mechanism that today is more commonly described through the notion of *user friendliness* - to become the leading paradigm of an emergent computing industry. Especially from the 1980s onward, companies such as Microsoft and Apple made explicit efforts to design and bring to mass fruition digital devices and software that could be employed by users with little technical skill and previous knowledge. As Michael Black (2022: 2) put it, according to the growing paradigm, "computers would need to be 'transparent' in a phenomenological sense so that users would not think of themselves as operating a machine at all." In this sense, in the 1980s and 1990s the paradigm of user friendliness that emerged and developed in the personal computing industry involved the dream of a user experience that would know no friction. Similarly to how the emergence of the serialized novel in the nineteenth century linked to efforts of writers, editors and publishers to reach the burgeoning mass market for popular literature, and to how television scheduling fit within the business model of TV companies as a strategy to hook audiences, user friendliness was never just a design ideal for improving user experience. To companies such as Apple and Microsoft, user friendliness meant making computers accessible to a huge potential number of users that had no specific skills in computing but could be reached by "friendly" interfaces (Pfaffenberg, 1988).

One of the design concepts that accompanied the emergence of new digital interfaces destined to the general public was the notion of "seamless interaction," which imagined that a perfect, frictionless integration between the computing system and the user was possible and, more importantly, desirable. Seam is the place where two pieces of fabric are sewn together in a garment or other article; a seamless interaction is something that does not separate between the digital system and the user who accesses it, creating an idea of continuity that programmatically

negates the presence of friction between users and media. In fact, metaphors employed to express this sense of continuity at interface level included the flow (Coyne et al., 2004), reverberating the dream of “seamless” television programming and spectatorship.

Even if the idea of making computers “transparent” and interaction “seamless” was driven by the stated goal of enhancing usability, this aspiration ultimately clashed with the concrete experiences of computer users. Black (2022) underlines the normative character that the idea of usability entails in design circles and the fact that user friendliness often serves to advance the designers needs before those of the users. One of the implications of the notion of user friendliness, after all, is that the internal functioning of the machine actually becomes more opaque to users (Black, 2019). Designing transparent computers, in this sense, entails creating an intuitive surface that hides the underlying structure of the technical systems to which it gives access (Chun, 2011; Emerson, 2014). Paradoxically, as argued elsewhere, this implies that “transparency” in computer design means adding opacity to the computer system, creating a black box whose internal functioning would be inaccessible to users. Such “opaque transparency” (Natale, 2021) promises usability for users, but ultimately creates an imbalance of power and knowledge between the users and the designers or companies who develop the systems. While aspects of the actual functioning of the device or platform is hidden to users, developers may be able to access, test and program the technical structures of the system. This imbalance often does not align with actual usability, but rather with the pursuing of specific interests and goals from the production side. A private company such as Facebook, for instance, may seek to design a social media platform to maximize connectivity and consumption, thus enhancing financial gains through the selling of advertisements and the production of data about users (Karppi, 2018). This cannot always align with the interests of the users who navigate the platform; it may indeed “shift their attention away from reflecting on their inability to see the mechanisms that surveil and constrain their behavior” (Black, 2022: 3). Seamlessness can therefore translate into less control in the hands of users, as the functioning of dynamics and systems is hidden from the user’s perception, subtracting their capacity to choose and access among potential functionalities (Shneiderman, 2022).

Seamless interaction, moreover, can collide not only with the interest of users, but also with people’s lived experiences of digital interfaces. Interface design usually entails constructing a model of an ideal user against which principles such as transparency and seamlessness are adapted. This model does not account, however, for the actual diversity of users in gender, race, class, and language (Natale & Guzman, 2022). Additionally, the ideal user modelled within the scope of computing design does not consider the spectrum of disabilities and impairments that



apply to all human bodies; as scholars in disability studies have shown, in fact, the notion of ability itself is grounded on a normative assumption, concealing the fact that people's experiences can never be encapsulated through such notion (Sterne, 2021; Napolitano et al., 2023). Finally, the idea of seamless interaction does not account for the fact that users, as argued in this paper, ultimately 'resist' the technology even while they adopt and embrace it. Perfect transparency and seamlessness, in this sense, is not actually functional or even desirable. Coyne et al. (2004: 433) provide examples of technologies, such as musical instruments, whose functioning arguably rely on the very "seam" that separates the instrument from the performer. Similarly, Human-Computer Interaction researchers and practitioners have advocated the need and advantages of seamful interface systems in digital technologies, whereby friction is not denied but made integral to the affordances of the device (Chalmers & MacColl, 2003). Approaches to design justice have shown that adopting universalist design principles and practices ultimately erase groups of people who do not align with the model built by the interface: in airport control machines, for instance, people who do not fall within an acceptable range of 'deviance' set by the algorithmic systems might be singled out as risky and subjected to a disproportionate regime of surveillance and harm (Costanza-Chock, 2020). Design justice, in this sense, entails the recognition that users resist the bias built onto the systems, counteracting the rhetoric of transparency and seamlessness.

Another example of how the ideal of seamlessness collided with the need to account for the plurality of human users and their experiences can be found in the historical trajectories that went beyond personal computing towards mobile media and wearables. As seamlessness became increasingly an ideal feature in ubiquitous computing, it coalesced in the aspiration of making computers transparent to the point of becoming literally invisible, i.e. indistinguishable from the wider environments in which they are embedded and used (Inman & Ribes, 2019). This approach to seamlessness was offered by personalities such as Mark Weiser as a potential way to counteract what was perceived as one of the shortcomings of personal computers, i.e. their tendency to absorb users, taking up significant parts of their lives (Tinner, 2023). This interpretation, however, did not account for the fact that - as shown by work developed by Weiser's colleague at Xerox Parc, anthropologist Lucy Suchman (2007) - users' experiences are situated in complex environments and therefore cannot correspond to any abstract model that is conceived inductively in usability debates. The contrast between Weiser and Suchman's views, in this sense, can be reinterpreted with regard to the debate regarding the role of friction, which Suchman understood as a constitutional dimension to human-computer interaction due to the inherent situatedness of computing technologies.

In summary, the dream of an interactive system that eliminates any possibility of friction between users and digital platforms stands at the core of the user friendliness paradigm. Since the late 1970s and early 1980s, notions such as transparent computers and seamless interaction came to dominate the nascent personal computing industry (Black, 2022). Although interface designers in the next decades have developed sophisticated digital devices and systems to pursue such aspiration, a frictionless user experience remains an ideal but ultimately impossible goal. The diversity of users and the subjectivity of their experience and engagement makes this vision neither desirable nor achievable, providing additional evidence to the structural role that friction plays in all kinds of interactions between users and media technologies.

## **Conclusion**

Through an in-depth exploration of three historical case studies, i.e. the serialization of the novel in the nineteenth century, television scheduling and the metaphor of the flow and the emergence of personal computing, this article contextualizes the ideal of a “seamless interface”, that is the perfect interactive system that eliminates any possibility of friction between users and digital platforms. We demonstrate how, albeit in different contexts (e.g. print media, audiovisual, computing) and through different conceptualizations (e.g. absorption, flow, user friendliness), visions of frictionless interfaces and, on the other sides, the inescapable presence of friction have shaped the history of media technologies since at least the early nineteenth century.

Resonating with the main theme of this special issue, this article shows that the dream of building a seamless relationship between media and readers, viewers or users remained ultimately unattainable due to the inherent and inescapable friction that persists between these two sides. The discrepancy between expectations and actual interactions with various media highlighted the creation of ambivalent emotions, which were thought to be an essential element of people's involvement with media. The longer history of media ‘resistance’ (understood, as argued above, as a “standing firm” that characterizes the experience of users even alongside high levels of adoption of a technology, and not only as an explicit opposition against such technology) offers a helpful starting point for understanding modern digital landscapes, where the pervasiveness of digital platforms is accompanied by a feeling of deep ambivalence among users, as shown by the escalating public worries about the social costs of digital connection.

There are various elements that are similar in all the three case studies explored and are worth pondering. First, there is always an underlying business model which is based on enhancing readership, spectatorship or connection. This is linked to the development of various strategies aimed at hooking and capturing readers, spectators, or users (e.g., seriality, flow, and user

friendliness). The deployment of hooks and cliffhangers in feuilletons, television, and interactive personal computer design underscores a remarkable parallel in narrative engagement across different media platforms and ages. Feuilletons employed hooks, narrative elements designed to capture readers' attention at the outset. Similarly, television programmes adopted these techniques to maintain viewer interest between episodes, relying on cliffhangers to create anticipation for the next instalment. This parallel extends into the realm of interactive personal computing design where the hooks and cliffhangers used in feuilletons and television find a contemporary counterpart in user-friendly interfaces, gamification, and open-ended affordances. For instance, in interactive PC applications, the initial user interface serves as a hook, capturing users' attention and inviting them to explore further. Gamification techniques introduce cliffhangers, creating moments of uncertainty or challenge that encourage continued interaction. The essence of these narrative strategies remains consistent: to captivate and sustain audience interest in diverse periods of media evolution.

Another common thread weaving through the three historical examples is the persistent and dynamic presence of flow. Feuilletons skillfully employed an ever-changing narrative flow to captivate audiences over numerous instalments. Similarly, television broadcasting was perceived through the prism of a seamless flow that extends beyond individual programs, constructing a cohesive and immersive experience for the audience. In the digital era, we've already examined how social media platforms leverage "emotional flows," as defined by Karppi (2018), to capture and retain users. Beyond this, the concept of flow significantly influences the study and development of video games. Mihaly Csikszentmihalyi's positive psychology-based definition (2008) emphasizes an optimal psychological state achieved through deep engagement in an activity. However, the application of flow often lacks critical scrutiny and tends to be overly enthusiastic (Soderman 2021). Soderman challenges this tendency by delving into flow's historical, theoretical, and ideological contexts. He argues that strategically incorporating flow in game design extends playful consumption, shaping players as media consumers within a capitalist framework. Soderman explores diverse perspectives on flow, addressing its role in coping with alienation and commodification. He advocates for innovative game architectures that promote critical flow and underscores the need for diverse representations. Flow, rather than a neutral state, evolves into an ideology favouring individuality, growth, and action over critical examination. His exploration unveils the intricate connection between flow and capitalist consumption in the realm of video games. Soderman critically evaluates how video games, designed to induce flow, serve as potent tools for extending playtime and fostering immersive consumption, entwining play, flow, and capitalist ideologies in the digital landscape.

An additional common element is constituted by the forms of resistance to these strategies, which is something that is embedded into the very uses. Throughout this paper, in our understanding of media resistance, we have recovered the latin meaning of the term *sistere*, which denotes the act of maintaining one's ground, to be able to "stand firm," or to remain true to who you are, even in the face of an increasingly more saturated and pervasive media environment. In this context, friction appears as an intrinsic and unavoidable part of all forms of media engagements, demonstrating how an utterly seamless "media life" (Deuze 2012) remains unattainable.

The emergence of the different media technologies and forms reviewed here involved the construction of a set of complex, stratified practices and strategies to maximize involvements of readers, spectators and users - for instance, in the case of the serialized novel, the combination of lateral development with progressive movement of the main storyline. Similar strategies can be compared with solutions adopted in a range of different contexts. As scholars such as Tero Karppi (2018) have shown, for instance, developers of social media platforms implement a number of design elements, such as the "Like" function, to stimulate what he calls 'emotional flows' that motivate users' to spend more time on the platform. The importance of such elements is evident if one considers that the main business model for these platforms is users' connectivity: the more users remain connected and use their services, the more a platform such as Facebook, Instagram or TikTok makes money (Van Dijck, 2013a). The dream of total connectivity, therefore, aligns with the business goal of social media companies. Yet, as for all the cases examined in detail here, connectivity can never be absolute, and users' disconnection practices remain widespread as much as connectivity is ubiquitous in the digital age (Kuntsman and Miyake 2022). As shown by Manzerolle and Daubs (2021), moreover, digital platform companies have struggled to develop 'frictionless' transactional capabilities to facilitate monetization of online services, but are forced to clash with the practical difficulty to develop such a vision. Despite efforts of designers and entrepreneurs, friction will continue to define user engagements with contemporary social media platforms.

One might object that other media, such as wearable devices, offer a more seamless experience that can somehow come closer to a frictionless engagement. However, that does not seem to be the case. For instance, the very marketing campaign of the Apple Watch was based on the idea that it would provide us more autonomy by making us disconnect from other digital devices such as the iPhone (Natale and Treré, 2019). Yet in reality the introduction of this watch inserted new frictions and complications within the media ecology of users who struggled to find a balance between their smartphones and this new gadget. As argued by Treré (2021), if we

consider the whole media ecology of devices and platforms with which users interact, it becomes apparent that even wearables and other ideally seamless artefacts bring into being new frictions and forms of resistance to digital technologies. Wearable technology can never fully replace other “more demanding” media, since they are always inserted within a pre-existing technological matrix spawning new challenges, adjustments and conflicts. Therefore, even wearables can never be completely seamless extensions of the body and the human because - as this paper has argued - friction represents an inherent, constitutive element of our engagement with any media technology from the print press to digital platforms.

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