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# Positive by Design

## The Next Big Challenge in Rethinking Media as Agents?

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### ABSTRACT

Hypertext and Web pioneers had high aspirations and expectations about the potential positive impact of technology. However, studies in the last decades have shown how widely adopted social and intelligent media are either amplifiers or a source of adverse detrimental effects on their users. On the one hand, we now have a better understanding of these negative phenomena and strategies to identify and quantify their effects. On the other hand, as a community, we should take on the challenge of steering hypertext technologies toward positive applications. This position paper argues for a proactive role of the hypertext community in the design of agent media result of combining social media with intelligent algorithms. This silent paradigm shift introduced third-party proactive agents in a wide range of human-to-human interactions. We are today at a point where social media and global web applications cannot operate without such systems and demand, in the author's opinion, a similar proactive role of academia and scholars in understanding and driving their design for positive goals. This position paper outlines the need for this challenge to be taken on, and how and why the Hypertext community could lead in its own way this vision forward.

### CCS CONCEPTS

• **Human-centered computing** → **Hypertext / hypermedia.**

### KEYWORDS

positive media, positive computing, social media, intelligent media, hypertext

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## 1 INTRODUCTION

Hypertext and the Web were found on high aspirations and expectations about the positive impact of technology. These aspirations seem today a far cry compared to well-documented evidence about the negative effects of mass digital media on mental health and

conflicts among and within communities. At best, mass web technologies amplify the worst tendencies in society. At their worst, these technologies miseducate about respect and responsibility in the public sphere, enabling users to, e.g., bully, cheat, steal and incite self-harm without much repercussion.

Today, a comparable vision for good technology can be found in specialist communities like positive and digital healthcare. As a field, positive computing [5] focuses on applications of digital technologies to well-being or with *positive* outcomes for users.

In some regards, positive computing is partially fulfilling the hypertext vision through the use of web technologies and intelligent algorithms for self-help groups, timely identification of risks and behavioural interventions. Beyond specialised technologies, the most used technologies like apps, search engines and social media do not incorporate more than basic safeguards, like tracking of use time and minor safeguarding tools. Arguably, the current approach is mostly reactive mitigation of effects exposed by horrible cases of misuse and harm. In our own way, the Hypertext conference is keeping a similar reactive approach in documenting and studying such effects without pursuing an explicit agenda for positive media.

This is a missed opportunity for the community to find a common agenda integrating its humanistic sensibility with design and computation skills. We now have a better understanding of these negative phenomena and strategies to identify and quantify their effects. As such, we have the chance to take on the challenge of steering web technologies toward a positive paradigm for the next decade.

Activism and a positive vision for social change are not new to academia and scholars. This commendable effort is common in several communities that are more engaged in topics like policy-making and democratic processes. However, this position paper argues that the Hypertext community should take this challenge at a different level: defining and translating a common notion of positive effects into a range of technological challenges.

For this purpose, this contribution discusses lessons from positive applications of Web technologies and social media to build a common understanding of what positive effects the community should look at. The urgency of this agenda is connected to the silent paradigm shift that the combined use of intelligent algorithms and mass social media, and the upcoming AI revolution. Indeed, these new *agent media* re-calibrate social relations by introducing third-party agenda and non-replicable experiences based on the personalisation and adaptation capabilities of such agents.

These new agents do not have a passive mediation like classic static artefacts but are proactive actors in our societies. As such, beyond safeguards, we should ask what good these agents can make and what should be the principles of a *positive-by-design*



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approach. This is not new by any means [3, 25]. For instance, the Positive Design movement investigates how design can lead to subjective well-being, pointing out that, in this line of enquiry, “the relevant question is not whether products contribute to happiness, but how” [7]. In the context of hypertext, however, these questions should lead to a renewed set of technological challenges concerning how to encode and manage a positive digital mediation, that could achieve predictable results similar to the intervention of specialist professionals in, e.g., conflict management, education and rehabilitation.

## 2 POSITIVE APPLICATIONS OF WEB TECHNOLOGIES

The scale of this challenge is of a different level: specialist applications can rely on committed users and technology providers while a generalist approach must provide an unequivocal value that emerges in a wide range of settings. Success would contribute to global challenges by converting intelligent systems and social media into an asset for the public good. However, failing to do so or promoting the wrong approaches could result in even bigger negative effects on a global scale.

Can we establish principles for positive-by-design web technologies? Looking into positive applications of web technologies is a starting point to build a common understanding of what these principles should be.

A remarkable example is the use of forums by self-help groups [12]. Self-help groups are online communities users provide mutual support in facing sensitive issues such as mental health [11, 15], disability [9], living with chronic conditions [14, 20], suicide [21] and wellbeing in general [13] protected by anonymity and with people with similar life experiences. The lessons learned from these early experiences can be found in a new class of platforms like Discord: enabling groups to grow and protect private networks supported by state-of-the-art communication mechanisms without being detached from the Web. Furthermore, self-support groups provide an example of positive anonymity that protects minority groups and individuals that would be at risk if exposed. The anonymity and privacy provided by moderation and screening of new users configure for many the safe place that makes the difference between developing severe mental health conditions and keeping balance and independence.

Beyond the domain of health and wellbeing, other applications in the field of cultural heritage, governance and knowledge sharing have a positive impact on, e.g., the accessibility and democratization of knowledge for communities and individuals without the resources and possibilities to get access to books, training, and cultural resources in general. The open data movement integrated the Open Government instances for accountability and transparency in decision-making into practical tools like ontologies and data marketplaces that are common today in all developed countries.

Concerning accessibility, the Web Content Accessibility Guidelines (WCAG) standard [4], HTML5 [10], Accessible Rich Internet Applications (WAI-ARIA) tags [18] and a rich ecosystem of tools made it possible to improve accessibility at scale. Indeed, understanding how to support accessibility for a variety of different disabilities and profiles in the neurodivergent field is daunting for

experts and outside the scope of most web developers and designers. The definition of standards and toolkit for accessibility made a practical positive impact on a silent community of users. These expand beyond the web to all HTML-based interfaces like mobile and desktop apps. Intelligent systems like Grammarly help non-native speakers and people with learning disability to be more confident in writing with positive effects on their inclusion in schools and at work.

### 2.1 Scaling up a vision for positive media

Positive uses are relevant yet limited compared to the risks and damages that emerged from the large-scale use of intelligent systems and social media. These risks and damages are the results of unforeseen uses of technologies but also the result of deliberate choices. For instance, news outlets are full of reports about online bullying, extremist groups using social media to recruit, and disinformation jeopardising social cohesion and institutional efforts on managing emergencies such as the Covid-19 pandemic. However, the effects of intelligent algorithms alone are being proven to be detrimental to mental health and social cohesion. Studies show links recommendation algorithms in social media with depression [6, 23], and radicalization of online discourse [8, 19, 24]. These are not results of misuse but, we will following argue, the unforeseen consequences of a miss-placed focus on wrong evaluation metrics instead of positive impact.

More changes are coming about AI. Indeed, focus on ethics of AI focused on basic principles such as the impact on human agency and explainability of automated reasoning [16] and general principles for AI-driven systems [22]. A growing general concern from research communities pointed out about potential negative applications such as armed robots, and the hallucinations of generative AI.

The need to ramp up our effort is connected to the proactive role of agent media in shaping society. Firstly, the implications of moving from static to agent media must be explored and converted into new conceptual tools. Secondly, we need to identify the practical technological challenges required to identify and manage the *positive qualities* we aim for. This second point will be addressed in the conclusions while the first is the topic of the next section.

## 3 THE AGENT-MEDIA PARADIGM

The media we used to know were all static artefacts. From clay tablets to a word processor, from material to digital artefacts, humanity learned how to create and use media in our activities around the principles of predictability and reliability. Regardless of their purpose, shape or material qualities, we use them counting on media being a commonality. E.g., a book does not change while passing from hand to hand; a contract can be interpreted differently, but its trace is not to be contested. As such, a great effort was placed into developing solutions to ensure the veracity of content through the engineering of media and practices around them like handwriting signatures, certifications, and stamps to blockchain infrastructures.

The change from static to agent media is the result of global web applications and the need to tame unprecedented *big data* repositories. Intelligent tailoring of content was introduced to improve quality but, today, profiling and recommendations are structural components of any large-scale application. For instance, what would be Facebook, Twitter or YouTube without intelligent filtering? How users could browse Amazon's catalogue without recommendations or related products?

The blending of user-driven platforms and intelligent systems configured in the end a new type of media agent that mediates between individuals and communities. On the one hand, software agents are proactive in pursuing the goals of their owners, recalibrating the relationships [1] around a third-party definition of *good* results.

Indeed, the ability to proactively engage, acquire information and revise its model of the world marks the key difference with static media. Notifications, recommendations, and suggestions are mechanisms that, in this view, media agents use to probe and interact with us, their customers-users and the target of their goals.

It is worth highlighting how the goals of different actors (human or software agents alike) are rarely aligned. For instance, while our goal would be to spend more time with our families and friends, social media engage in exploiting nudging and other cognitive hacking strategies to lock us in. For many victims of online stalking [2], posting a social media does not involve the intention to notify an ex-companion and potential stalker. Similarly, for a social media stalker being notified does not help in moving on and avoiding engaging with unsavoury acts. These effects are the result of conflicting goals.

The static nature of classic media plays a role more important than intuition can tell. This single point should require a long dissertation on the pragmatics of communication and cognition. For the sake of synthesis, we can explain the role of static media by using two of the several frameworks developed by Don Norman: the gulfs of execution and evaluation, and knowledge displacement in the mind, things and world [17]. The two gulfs exemplify how media and mind theories are intertwined.

According to Norman, prior to interacting with an artefact, we build a driving theory of that object (crossing a first gulf of execution). Then, we revise our model of the artefact by looking at the effects of the interaction (crossing a second gulf of evaluation). A static artefact is predictable and the knowledge we acquire through interaction is mostly monotonic (more knowledge does not invalidate our previously acquired knowledge). The more we know and the better we understand a static artefact: we can count on acquired knowledge and on a kernel of the artefact that does not change. This is true for bricks or complex software. Predictability is what we rely on while using media: experience may differ but the interactions and behaviour of an artefact are what we share no matter what.

In this view, we can see how static media can be used to communicate between, e.g., the designer and the user, the author and the reader or any two subjects and groups. Norman points out that artefacts encode knowledge through their design that we intuitively recover and use. This knowledge complements the "knowledge in the mind" and the "knowledge in the world", i.e., what we know as individuals and what is in the public domain of a community

of practice. As such, adaptive personal media does not contribute the same information to two different users: it is knowledge in the object that is accessible to only a single individual.

While hypertext systems support personalised experiences, they do so by relying on a static system. For instance, a hypertext novel can provide a variety of different pathways but it does it through a common set of reliable rules. In theory, the conditions for the personal experience are indeed replicable by others, given the description of steps.

The misunderstanding about this basic difference is, in the author's opinion, the root cause for the current issues with social and intelligent mass media. For instance, sharing social media content involves the generation of personalised frames: the context through which the content is presented. This context is the lens through which we visualize and interpret facts, ideas and opinions, lenses we do not share and control.

Addressing this misunderstanding still leaves us with this new status quo that we have yet to master. In this view, the next section provides input for the community.

## 4 OPEN QUESTIONS

The first question concerns the definition of positive. What is an expected positive outcome of using a specific digital medium? In this regard, a humanistic approach should be the key driver for leading the definition of positive-by-design principles toward a holistic vision for the development of society as a whole and helping to overcome the limits of the individualistic vision of much of approaches to technology for well-being.

The second most urgent question is about what metrics could we use to identify positive effects that could be integrated into software agents. Indeed, the evaluation of systems is based on performance metrics, like the time users spent on a platform or the number and type of interactions (like clicks and scrolls). Similarly, new methods are evaluated by comparison and benchmarking on technical metrics such as precision and recall, or information loss that are not directly connected to effects or impact. The evaluation of such effects is retrospective and done on systems that are already in the wild or at an early-production stage, too late for drastic changes. We need metrics that would capture, e.g., a positive disengagement with media (less time) and improvement of the quality of social interactions over quantity, or a positive impact on activities against a number of clicks.

These questions tap into the elephant in the room concerning public research on web technologies and social media: the marginalization of academia and public entities due to the imbalance of funds, data, computational resources, information and talents. The web is an industry-led sector, this is a hard fact that is hardly be changed in the near future with very concrete effects on what, as the Hypertext community, we can do. The question is in which capacity intellectuals and scholars can contribute and how beyond the public discourse in shaping the technologies of tomorrow. For instance, what are the new basic rights of nations and related obligations we should demand from the industry to support research for the public good? What partnership we should seek and on what common platform?

Lastly, we need to revise our practices. Building systems is not enough to achieve positive results and we should start focusing and acquiring competencies about how to design technology-related practices. How should we reorganise our community to support the interdisciplinarity required to design both positive technologies and practices? How should we reformulate our curricula?

## 5 CONCLUSIONS

In conclusion, this contribution is both a vision, an opinion piece and a political statement about the role of our community. This is the result of a desire to see technologies that make us better individuals and also better collectives. This challenge demands a bar higher of avoiding risks but enquiring about what technology can do to education, resilience, recovery and growth. However, we still miss the language to think *positive-by-design* technologies and the definition of the technical challenges we need to overcome (if we wish to go toward this direction).

A counterargument for this proposal would source from a libertarian view of technology innovation that should be driven by the free market. Indeed, this proposal is grounded on a *Republican* idea that mass media hold a public role and should be treated as a public infrastructure. These two positions are both legitimate sources of positive tension that could drive sustainable innovation. However, it is the author's belief that this tension can be achieved only if we have actors taking on the proposed proactive stand. It is also the author's opinion that the Hypertext community can take a leading role in being a historical bridge between computer science and literature and the renewed interest in the Humanities in general.

In practical terms, the author would advocate for further strengthening the community's focus on a humanistic vision of technology. This vision could be achieved through, e.g., specific tracks about positive applications and critical analysis of social media practices, that should provide actionable recommendations (as in the style of CHI briefs) about replicating positive practices using hypertext technologies.

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