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Technological Citizenship in Times of Digitization: An Integrative Framework

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Abstract

This article introduces an integrative framework for technological citizenship, examining the impact of digitization and the active roles of citizens in shaping this impact across the private, social, and public sphere. It outlines the dual nature of digitization, offering opportunities for enhanced connectivity and efficiency while posing challenges to privacy, security, and democratic integrity. Technological citizenship is explored through the lenses of liberal, communitarian, and republican theories, highlighting the active roles of citizens in navigating the opportunities and risks presented by digital technologies across all life spheres. By operationalizing technological citizenship, the article aims to address the gap in existing literature on the active roles of citizens in the governance of digitization. The framework emphasizes empowerment and resilience as crucial capacities for citizens to actively engage with and govern digital technologies. It illuminates citizens' active participation in shaping the digital landscape, advocating for policies that support their engagement in safeguarding private, social, and public values in the digital age. The study calls for further research into technological citizenship, emphasizing its significance in fostering a more inclusive and equitable digital society.

Keywords Technological citizenship · Digital technologies · Citizenship · Liberalism · Communitarianism · Republicanism

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1 Introduction: Technological Citizenship

Digital technologies have proliferated into human life. From communication to financial transactions, the media to politics, and agriculture to space travel, computers and the internet increasingly form the foundation for any endeavor in contemporary life. Digitization provides for great possibilities, as it makes life faster, more efficient, and enables worldwide communication. However, digitization also directly impacts citizens in their private, social and public lives by affecting values such as privacy, autonomy, and security (Royakkers et al., 2018; van Dijck et al., 2018). For example, digitization can put pressure on the power balance between citizens and their government, as it allows for the collection and analysis of large amounts of citizen data without sufficient democratic checks and balances (Solove, 2007). Digitization may pressure citizens' security, as the digital infrastructure is vulnerable to a variety of cyber-attacks targeted at public organizations and individual citizens (Munnichs et al., 2017). And digital technologies such as deep fakes carry the risk of weakening core democratic functions and norms by impeding the inclusion of citizens in political debates and undermining the quality of deliberation in the public sphere (Pawelec, 2022). As a result, decisions about the development and introduction of digital technologies made by technology developers, policymakers, and politicians can have significant consequences for the well-being of individuals, communities, and society as a whole. Citizens, however, also play a critical role by actively participating in the development, use, and governance of digital technologies in society. In this article, we aim to clarify the various roles of citizens in the governance of digital technologies. To get a grip on these roles of citizens, we introduce and elaborate the notion of technological citizenship.

The academic discourse surrounding citizenship and digitization attempts to theorize the interplay between digital technology and citizenship, focusing on aspects such as rights, responsibilities, technological awareness, and participation in digital society. However, the existing literature falls short of encapsulating the comprehensive spectrum of citizen engagement and its implications across diverse life domains. For instance, the notion of digital citizenship has been explored in terms of the essential values, skills, and knowledge needed for digital navigation (Pramanda et al., 2021; Richardson & Milovidov, 2019), to comprehend the new experiences of citizenship in online environments (McCosker et al., 2016), and in the context of digital infrastructures facilitating societal participation, like Estonia's e-residency program (Tammpuu & Masso, 2019). Further, the notions of algorithmic citizenship and ordinal citizenship introduce the role of digital technologies in social inclusion and differentiation (Cheney-Lippold, 2016; Fourcade, 2021). Moreover, 'technological citizenship' is introduced to refer to awareness of the technologically mediated society as a citizen (Kool et al., 2017; van Est, 2016; Verbeek, 2020) and the need for proper institutions that enable citizens to exercise their citizenship rights and duties in a society highly impacted by technology (Frankenfeld, 1992). Finally, authors have explored how digital technologies mediate citizens' possibilities for political engagement (Belkom, 2022).

While the existing literature illuminates important aspects of the diverse ways in which technology impacts the concept and practice of citizenship, the discourse often

overlooks the multifaceted contributions of citizens to the governance of digitization. We identify a gap in tools for analyzing and assessing the active role of citizens in shaping the impact of digitization on society that transcends political engagement. This article aims to fill this gap by highlighting citizens' empowerment and resilience in dealing with the opportunities and risks of digitization across different life spheres. Our framework illuminates how the actions of citizens within their private life, social sphere, and public sphere contribute to shaping the impact of digitization on society.

This article proposes an integrative framework to comprehend and assess the interconnectedness of actions and impacts across private, social, and public spheres by emphasizing the empowerment and resilience of citizens in navigating the digital landscape. The necessity for this integrative framework stems from the profound influence of digitization on citizens' lives, civil society, and democratic processes. Our framework aspires to offer a holistic understanding of digitization's effects, recognizing citizens as active agents in shaping the governance of digital technologies rather than passive recipients of their impacts. This holistic understanding of the impact of digitization and citizens' actions across different life spheres is necessary to understand the contemporary roles of citizens in the governance of digitization.

The digital age introduces specific tensions between private life, civil society, and democratic values, making the framework of technological citizenship particularly relevant. It sheds light on the challenges and opportunities presented by regulatory mechanisms, privacy concerns, and the disruptive narratives of Big Tech, emphasizing the need for a holistic policy-making approach that considers the broader ecosystem of technological citizenship. The model can serve as a foundation for dialogue among stakeholders from different spheres, including citizens, policymakers, community organizers, and tech companies. By mapping out the dynamic interactions between spheres, the model fosters a shared understanding of conflicting interests and priorities, creating opportunities for negotiation and compromise. Importantly, the framework illuminates the different roles of citizens in dealing with these tensions, including forms of citizen action that are not always understood as participation (Chilvers & Kearnes, 2015), such as citizens who protest governmental policies, or citizens shaping their private lives with the use of digital technologies.

The concept of technological citizenship can productively be used to clarify, investigate, and provide insight into the role of citizens in a democratic constitutional state in the digital age. Therefore, in this article, we operationalize the notion of technological citizenship. In Sect. 2, we provide, based on political philosophical theories on citizenship, an overview of the different spheres of technological citizenship: the private, the social and the public sphere. We discuss for each sphere how digitization impacts the sphere, and how citizens can deal with the impact of digitization within each sphere. In Sect. 3 we provide three examples that demonstrate each sphere as a space for impact and action, emphasizing how digitization both shapes and is shaped by citizens' engagement in the digital age. We will end with conclusions and suggestions for further research.

2 Three Spheres of Technological Citizenship: Private, Social, Public

Citizenship is perhaps *the* central concept in a democratic constitutional state. That probably explains why citizenship is brought into connection with a wide variety of societal and political problems. As Bellamy puts it: "Whatever the problem– be it the decline in voting, increasing numbers of teenage pregnancies, or climate change– someone has canvassed the revitalization of citizenship as part of the solution" (Bellamy, 2008, p. 1). This explains the proliferation of 'citizenship' with a plenitude of adjectives that specify the topic of concern, such as critical citizenship (Johnson & Morris, 2010), data citizenship (Carmi et al., 2020), and digital citizenship (Calzada, 2022; McCosker et al., 2016; Mossberger et al., 2008; Richardson & Milovidov, 2019; Tammpuu & Masso, 2019). At the same time, there is no single authoritative definition of citizenship. The concept of 'citizenship' possesses the characteristics of an essentially contested concept (Gallie, 1955; Maier, 2021; Menéndez & Olsen, 2020). In fact, the concept 'citizenship' is among the most contentious concepts in theory of law and political theory (Orgad & Reijers, 2020).

Consequently, in this article, we do not opt for *one* specific definition of citizenship to base our operational definition on, but instead opt for a collection of three well-known and widely used political philosophical visions on citizenship, namely the liberal, communitarian, and republican vision (Dagger, 2004; Etzioni, 2011; Honohan, 2017; Pettit, 1997). These three visions complement each other in the way they refer to the role of citizens in relation to their private environment, the social communities they participate in, and the political and administrative sphere. We believe that these three visions provide us with crucial building blocks to build a rich operational definition of technological citizenship. We use the central characteristics of these political philosophical visions to inform a new interpretation of citizenship in the digital context.

In the liberal vision, citizenship is mainly understood in relation to the private sphere (which concerns the personal situation, the family, and the private enterprise or *res privata*): the legal status and individual rights that enable individuals to live their private lives freely and peacefully alongside other citizens. In the communitarian vision, citizenship is primarily understood in relation to the social sphere and emphasizes the responsibilities of individuals towards the social communities they are part of, hereby promoting active participation in these social communities (the so-called common good or *res communes*). In the republican vision, on the other hand, citizenship is particularly understood as a duty for citizens to be actively involved in public affairs and emphasizes civic virtue and the public good (*res publicas*). This participation takes place in the public sphere, the 'space' where citizens communicate and debate about public matters (Arendt, 1958; Habermas, 1991; Rasmussen, 2014).

We do not aim to provide an exhaustive overview of these philosophical theories but draw upon their central characteristics to delineate the private, social and public sphere of technological citizenship. We view these visions of citizenship as equally valuable in their own way. As such, these visions exist next to each other. For example Hurenkamp et al. (2011) researched Dutch citizens' own visions of citizenship and found that some citizens understand citizenship in republican or liberal terms, and most citizens understand citizenship as referring to duties related to the communitar-

ian view. We take a similar view: these visions on citizenship have been developed in theory, and citizens might think and act in practice in a way that fits these conceptual frameworks. Importantly, the practical implementation of citizenship—how citizens 'act as citizens' in reality—might fit nicely within one particular vision but can also overlap and fit within multiple visions at the same time, merge from one vision into another, or expose frictions between the different visions.

In this section, we elucidate our integrative framework for technological citizenship. This framework dissects the concept of 'technological citizenship' into three distinct spheres—private, social, and public—each highlighting crucial facets of this multifaceted notion. Initially, for each sphere, we delineate its core attributes, drawing upon the liberal, communitarian, and republican perspectives on citizenship, respectively. Following this conceptual groundwork, we examine the influence of digitization on each specific sphere, noting that digitization invariably presents both opportunities and challenges for citizenship.

Subsequently, we explore the mechanisms through which citizens can navigate these opportunities and challenges within their respective spheres. This examination bifurcates into discussions on 'empowerment'—the capacity of citizens to harness opportunities—and 'resilience'—their ability to confront and mitigate risks. The engagement of citizens with technology, as a means to manage these opportunities and risks, is inherently mediated. Technologies predispose certain uses and dissuade others, thus shaping users' perceptions of their environment and their capacity to act within it (Verbeek, 2006). This mediating role of technology underscores the dynamic interplay between technological affordances and citizenship practices, highlighting the intricate ways in which digital technologies influence and are influenced by the exercise of citizenship in the modern world.

We thus describe each sphere of technological citizenship as a place of *impact* and a place of *action*. The private, social, and public sphere of citizens is *impacted* by digitization. But by *acting* within the private sphere (e.g. quitting Facebook because of privacy concerns), social sphere (e.g. contributing to an online community) or public sphere (e.g. protesting for net-neutrality), citizens can in turn exert influence and shape the impact of digitization within that sphere—or within another sphere. Citizens can deal with the impact in one sphere by taking action within the same sphere, or within another sphere. As such, each sphere illuminates different facets of how digitization both shapes and is shaped by citizens' engagement. Together, these three spheres of technological citizenship provide an integrative framework that acknowledges the interconnectedness of digitization's impact on citizens and the way in which citizens actively try to shape those impacts across the private, social, and public spheres (see Table 1).

2.1 Technological Citizenship in the Private Sphere

In this section, we draw upon liberal political philosophy to form the private sphere of technological citizenship. This sphere captures the impact of digitization on the private lives of citizens, and ways in which citizens may deal with the impact of digitization within their private lives. In the liberal tradition, the notion of citizenship

Table 1 The integrative framework of technological citizenship

	Private sphere	Social sphere	Public sphere
Political philosophical vision	Liberalism	Communitarianism	Republicanism
Citizen as…	Individual	Member of a social community	Member of a political community
Sphere	The personal situation, the family, and the private enterprise	The social communities that exist apart from the state and the market	The 'space' where citizens communicate and debate about public matters
Impact of digitization on sphere	Digitization might enhance individual autonomy, freedom, and rights, but might also impede individual privacy and autonomy	Digitization can enable new forms of community engagement and collective action, but also fragment traditional social bonds	Digitization can enable citizens to engage in public discourse and participate in governance processes, but also pressure the free exchange of ideas by disrupting established means of communication
Action: empowerment	The ability of citizens to seize the opportunities of digitization within their private sphere	The ability of citizens to seize the opportunities of digitization within their social sphere	The ability of citizens to seize the opportunities of digitization within the public sphere
Action: resilience	The ability of citizens to deal with the risks of digitization within their private sphere	The ability of citizens to deal with the risks of digitization within their social sphere	The ability of citizens to deal with the risks of digitization within the public sphere

mainly refers to a legal status which comes with the right to shape one's own private life as a citizen and to be protected against unwanted interference.

Liberals view individuals as inherently independent, and freedom as natural and pre-political. For liberals, following the harm principle of John Stuart Mill (1859),

the freedom of the individual within a society should be preserved as much as possible, and can only be limited to prevent harm to others. From this principle follows that laws are seen as "a necessary evil" (Bellamy, 2008, p. 43) that should try to preserve the natural liberty of individuals as much as possible to enable a peaceful life in a shared community. According to liberal theories, states should preserve citizens' inherent freedom and independence, refrain from imposing a certain ideology or way of life and ensure the establishment of rights for individuals that protect them from interference by the state or others. The legal aspect of citizenship is crucial in the liberal vision, because it endows citizens with a set of entitlements that help preserve their various degrees of freedom.

Liberals emphasize the importance of individual autonomy and the right to pursue one's own interests. This emphasis on individual freedom often leads to the prioritization of negative liberties, which are freedoms from interference, such as freedom of speech, over positive liberties, which are freedoms to act. This means that liberals tend to focus on limiting the state's interference in individuals' lives, rather than advocating for the state to actively provide resources or opportunities to its citizens. This also means that citizenship, in the liberal vision, is primarily concerned with individual rights and obligations. A citizen is a 'good' citizen as far as she knows her rights and duties and makes use of them within the limits of respect for the rights of others. Citizenship, in the liberal vision, does not include any additional normative expectations of the citizen (Dekker & Hart, 2005), such as being actively involved in politics, because citizens are considered free to "decide what kind of citizen to be" (Schuck, 2002, p. 7).

In conclusion, liberals emphasize the importance of individual autonomy and freedom from interference by the state or others. This means that citizenship, in the liberal vision, is primarily concerned with individual rights and obligations and the freedom to shape one's own private life, while at the same time acknowledging and respecting the freedom and rights of others.

2.1.1 How Does Digitization Impact Citizenship in the Private Sphere?

In the private sphere, technology can be viewed as a tool that can be used by citizens to enhance their individual autonomy, freedom, and rights. Digital technologies offer unprecedented opportunities for individuals to access information, express themselves, develop themselves and connect with others globally. Digital technologies can therefore positively contribute to personal values such as autonomy and self-direction (Benkler & Nissenbaum, 2006). However, using digital technologies can also put citizens at risk of being scammed by phishing, tricked by disinformation, manipulated by personalized ads, stalked and extorted, surveilled by governments and private corporations, and overwhelmed by a flood of notifications and information, impeding their privacy, safety, mental health, personal freedom and autonomy. These risks necessitate legal and regulatory responses to protect individual rights in the digital age.

The private sphere of technological citizenship illuminates the fact that to sufficiently protect liberal values in the digital age, the liberal view needs expanding to incorporate the concept of digital rights, including privacy, freedom of expression

online, and protection against unwarranted surveillance. Redeker et al. (2015) have situated the initiatives calling for new digital rights under the concept of 'digital constitutionalism' which comprises initiatives that seek to "promote the recognition, affirmation, and protection of fundamental rights in cyberspace" (Wimmer & Moraes, 2022). Consequently, liberal states face the challenge of regulating digital technologies to protect individual rights without stifling innovation and freedom.

2.1.2 How Can Citizens Deal with the Impact of Digitization in the Private Sphere?

Apart from the necessary regulatory initiatives to deal with digitization, we want to emphasize that citizens also play an active role in dealing with the opportunities and risks of digitization in their private lives. By shaping their private lives, citizens can, in various ways, deal with the impact of digitization. Empowerment, in this context, refers to citizens seizing the opportunities that digital technologies offer to shape their private lives. For instance, citizens can use social media to maintain private relationships with close by or far away relatives and friends, use e-health technologies such as smart watches to get insight into personal health data, use apps such as Strava and TopLogger[1] to keep track of and share sport achievements, create and develop new digital technologies as a private enterprise, use digital maps for navigation, get informed about the news, or entertained by an endless supply of games, films, music, video's, and memes. Digital technologies can enrich and enhance individuals' lives, and empowerment in this context refers to individuals' ability to seize these opportunities.

The risks posed by digitization, on the other hand, require citizens to possess a certain level of resilience: skills and knowledge to be aware of, and able to deal with these risks. Being resilient to such risks can be achieved, for instance, by learning about and obtaining digital literacy and cybersecurity skills. Further, citizens can critically reflect on the impact of digital technologies on their private lives, social relationships, and society at large and adjust their use of digital technologies accordingly.

2.2 Technological Citizenship in the Social Sphere

In this section, we draw upon the communitarian political philosophy to form the social sphere of technological citizenship. This sphere captures the impact of digitization on the social sphere of citizens, and ways in which citizens may deal with the impact of digitization within the social sphere.

While liberal citizenship emphasizes the legal status of citizenship and individual freedoms, communitarian citizenship emphasizes the role of the citizen in the social and cultural community. The communitarian vision emphasizes the importance of social and cultural ties and collective identity. In this view, citizens are bound by social and cultural ties, shared values, and norms that are derived from their collective identity (Dekker & Hart, 2005). As communitarians argue that individuals are not

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[1] Strava is an app with social network features for tracking physical exercise such as running and cycling. TopLogger is an app for indoor bouldering and climbing where climbers can keep track of their ascents and progress.

independent agents but are instead shaped by the communities to which they belong, the flourishing of individuals is closely tied to the flourishing of the community.

Moreover, communitarians argue that citizenship is not only about rights but also about relationships. Citizenship is not just a status; it is a way of life that involves belonging to and being embedded in a community. In the communitarian vision, therefore, citizenship includes a normative dimension of what the 'good citizen' is, should be, or should do, beyond a legal framework. In the communitarian vision, citizenship is a reciprocal relationship between the individual and the community. Individuals are expected to contribute to the community, and in return, the community provides them with a sense of belonging, identity, and purpose.

What exactly constitutes a community is not clear-cut, but for a number of authors, community refers to "not the individual, not the family, not the state, not the market" (Frazer, 2000) but instead refers to all sorts of groups in between, such as neighborhoods, associations, and clubs. This implies that the community is separate from the government. Citizens, in the communitarian vision, are considered self-sufficient and are seen as creating and maintaining their communities with minimal government intervention (Hurenkamp et al., 2011). This is also what defines the 'commons' where shared life takes place; commonly owned domains or resources that are neither private nor public property (Lijster, 2022; Ostrom, 1990). Citizenship in the communitarian context thus refers to doing good for one's community, in principle inattentive to the governing legal-political order, such as a nation state, to which this community might formally belong.

Overall, communitarian citizenship emphasizes the responsibility of individuals towards their community and promotes active participation and engagement in community affairs. It stresses the importance of civic virtue, shared values, and solidarity among members of a community, and views the community as an entity that is greater than the sum of its individual parts. The central value of communitarian citizenship is, therefore, the importance of community relationships.

2.2.1 How Does Digitization Impact Citizenship in the Social Sphere?

In the social sphere, technology is a double-edged sword that can both strengthen and undermine communities. On one hand, digital platforms enable new forms of community engagement and collective action. Commons-based peer production platforms, such as Wikipedia or OpenStreetMap[2], can provide a social context in which social virtues such as generosity, kindness, and benevolence can be developed in the contributors (Benkler & Nissenbaum, 2006). On the other hand, however, online communication platforms or channels can fragment traditional social bonds and create echo chambers. The rise of big tech platforms has created a 'platform society', transforming common online spaces into commercial places, arguably putting pressure on public values (van Dijck et al., 2018). Social media platforms are struggling with content moderation of harmful misinformation such as Holocaust denial (Guhl & Davey, 2020). Online platforms can also bring together ideologically motivated

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[2] OpenStreetMap is an online, free, and open geographic database updated and maintained by a community of volunteers: openstreetmap.org.

extremist groups associated with violence, such as the involuntary celibate (incel) community[3] (O'Malley et al., 2022). As such, social media platforms struggle with providing a safe and equitable online environment for citizens to connect.

The social sphere of technological citizenship emphasizes the necessity to understand how digital technologies facilitate new forms of communal life, such as online forums, social media groups, and collaborative platforms. Also, this perspective demonstrates the need to examine the role of technology in supporting communal governance structures, including digital tools for participatory decision-making and collective resource management.

2.2.2 How Can Citizens Deal with the Impact of Digitization in the Social Sphere?

By acting within the social sphere, citizens can deal with the opportunities and risks of digitization. Empowerment, in this context, refers to citizens seizing the opportunities of digitization to create, maintain, and to let their social communities flourish. By means of digital tools, citizens can create or be part of online communities on the internet, such as interest groups on Facebook/Meta or Reddit. Being part of such an online community can provide a sense of belonging, as it brings people from all around the world in contact with each other around shared interests. Similarly, hacker and makerspaces provide communal spaces for citizens to come together and develop, fix, or adjust technological artifacts (Davies, 2018).

Further, digitization can enable citizens to help 'offline' community members. Online platforms can facilitate residents in a neighborhood to share tools, and apps can be used to coordinate communication to help each other out. Digital tools have also been proven to facilitate aid distribution during humanitarian crises. For example, citizens can monitor social media to understand where humanitarian aid is most needed (Lamoureaux & Sureau, 2019), or voluntarily contribute geographical information to open-source maps to facilitate aid distribution in areas affected by earthquakes or other natural disasters (Soden & Palen, 2014).

Resilience, in this context, refers to the ability of citizens to be aware of and deal with the risks of digitization within the social sphere. For example, citizens can warn and inform members of their communities about such risks, through the media, writing a book, making television or documentaries, or developing media literacy programs, etc. Citizens can also develop or move to new online community spaces that foster community values as alternatives to commercial social media platforms.

2.3 Technological Citizenship in the Public Sphere

In this section, we draw upon the republican political philosophy to form the public sphere of technological citizenship. This sphere captures the impact of digitization on the public sphere, and the ways for citizens to deal with the impact of digitization within the public sphere. The central value of the republican vision on citizenship

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[3] The incel community is an online subculture of men who define themselves as unable to get a romantic or sexual partner despite desiring one. Multiple mass killings and other acts of violence against women and sexually active people have been perpetrated by members of this subculture.

is for citizens to be actively involved in public affairs and to collectively shape the regulatory and institutional arrangements in society.

While the communitarian vision emphasizes the importance of community ties, the republican vision on citizenship focuses on the role of citizens in relation to the state. Republicans see citizenship as a duty and an obligation to the state. According to the republican vision, citizens are not only members of a community but also members of a political society governed by the state. Therefore, citizenship requires active participation in the political life of the state and a commitment to the public good. Central in republican theory is the idea that all citizens are equal and interdependent. Therefore, living in a republic entails the active commitment of all citizens in order to realize freedom and other public goods that individuals cannot achieve by themselves (Honohan, 2017). Under republican theory, laws create freedom, and citizens play a central role in their formation and the control of their implementation.

A distinction can be made between different strands of republican theory, for example: classical republicanism, which originated in the Renaissance inspired by classical antiquity, and neo-republicanism, which revives classical republican ideals since the 1990s. In the first strand, active citizenship, political participation and civic virtue are intrinsically valuable for human flourishing, whereas in the latter strand, they have instrumental value for promoting freedom as non-domination.[4] The philosophical framework of neo-republicanism centers around this notion of non-domination and this has practical implications for citizenship. According to the neo-republican view, a political system should be organized as a community of equal citizens governed by law, and the drafting and implementation of these laws should be under close collective control by the citizens themselves (Lovett & Pettit, 2009). This implies an active role for citizens in the political community. For citizens, this means that "the price of liberty is eternal vigilance" (Pettit, 1997, p. 6). To facilitate citizen vigilance, neo-republicans put forward the idea of 'contestatory democracy' (Pettit, 2000), which means that democratic institutions should give citizens not only electoral rights but also the opportunity to effectively contest the decisions of their representatives. To facilitate this, there is a need for "institutionalized forums for citizen contestation" (Lovett & Pettit, 2009, p. 25), which includes, for instance, protests, demonstrations, and the media.

While not explicitly compatible with the neo-republican view, we believe that the work of Rosanvallon (2008) fits well in the public sphere of technological citizenship, as he provides a valuable overview of three different forms of contestatory power that citizens can exert within a democratic society. Rosanvallon calls this 'counter-democracy' and it includes "the people as watchdogs, the people as veto-wielders, and the people as judges" (Rosanvallon, 2008, p. 17). As watchdogs, citizens are *watchful* of the performance of the government, for instance by exposing issues in the media. As veto-wielders, citizens *prevent* things from happening, for instance by blocking the implementation of a new law. As judges, citizens make use of the *judicial system* when they sense injustice in government policy, for instance by taking the government to court and letting the judge decide about a conflict. Through these forms of

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[4] The authors thank an anonymous reviewer for this point.

counter-democratic participation, in addition to the electoral process, citizens can be actively involved in the public domain and fulfill their duty of citizenship.

Overall, republican citizenship requires individuals to work for the public good. Citizens have a duty to participate in the political process, whether by voting, running for office, protesting, or engaging in public debate. In this view, the state is not just a neutral institution that protects individual rights; it is also an expression of the collective will of the citizens. Therefore, citizens are responsible for shaping the political direction of the state and ensuring that it serves the public good. Citizens are expected to put the public good above personal interests and to work together to solve social problems and promote the well-being of all members of the community. In the republican vision, civic virtue and the duty of political participation are the central values of citizenship.

2.3.1 How Does Digitization Impact Citizenship in the Public Sphere?

The republican tradition, with its emphasis on civic virtue and public participation, offers rich insights into the role of technology in promoting or hindering active citizenship. Technology can be regarded as a force that can both strengthen and undermine the public sphere. On the one hand, technology can enable citizens to engage in public discourse and participate in governance processes in more direct ways. Digital technologies can increase the accessibility of democratic participation, as it enables citizens to access information and it enables oversight and evaluation of the functioning of the government. Petition platforms, internet consultations and participatory budgeting tools are examples of ways of participation that have become more accessible by digital technology (Belkom, 2022). Moreover, digital networks enable people to meet and mobilize and digital technologies enable new forms of activism or protest, such as hacktivism and clicktivism[5] (George & Leidner, 2019). Finally, being an active member of an online community such as Wikipedia not only promotes the development of private and social values, but also republican values such as civic virtue and the striving for the public good (Benkler & Nissenbaum, 2006). The lens of technological citizenship in the public sphere highlights how digital platforms can nurture republican virtues by enabling citizens to engage in public discourse, participate in governance processes, and collaborate on public-interest projects. Republican ideas and ideals can also provide answers and insights in relation to the challenges brought by digitization for the public sphere and society as a whole (Hoeksema, 2023; Susskind, 2022).

On the other hand, technology can pressure the free exchange of ideas by disrupting established means of communication. Social media platforms can be understood as a form of domination of the public sphere (Aytac, 2022), which can undermine democratic processes (e.g. in the case of the Cambridge Analytica scandal) and contribute to the spread of disinformation and radicalization (Zimmerman, 2024).

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[5] Hacktivism refers to hacking to achieve social action or political objectives, and clicktivism refers to liking, upvoting, or following an activist post on social media or blog (George & Leidner, 2019).

2.3.2 How Can Citizens Deal with the Impact of Digitization in the Public Sphere?

By acting within the public sphere, citizens can deal with the opportunities and risks of digitization. There is a central role for the citizen in signaling and addressing the opportunities and risks of digitization. The previously mentioned concept of digital constitutionalism (Redeker et al., 2015) emphasizes that the creation of new regulatory and institutional arrangements to fit the digital age is an *ongoing process*. They articulate that the constitutionalization of digital technology transcends merely establishing a set of rules and laws; it constitutes a process in which technology continuously innovates and precipitates new societal challenges, necessitating ongoing regulatory responses. We emphasize that citizens have a central role within this process. Empowerment and resilience in the public sphere therefore refers to the ability of citizens to launch, respectively, the opportunities and risks of digitization on the public and political agenda through means of political participation. By 'political participation', we refer to all means of participation in the republican repertoire, such as voting, lobbying, commenting on legislative proposals, or running for candidate, and through the forms of counter-democracy (Rosanvallon, 2008), such as taking issues to court, exposing issues in the media, protesting policies and preventing the implementation of bills.

By acting within the public sphere, citizens can deal with the opportunities and risks of digitization for the public sphere *and* the private and social spheres. Citizens can, of course, also take action in the public sphere to launch private or social issues on the public agenda. For instance, successfully protesting against a new law that impedes privacy directly impacts citizens' private experience of privacy. The public sphere of technological citizenship thus provides a dual perspective: on the one hand, it illuminates the impact of digitization on the public sphere; on the other hand, it emphasizes the central role of citizens in identifying and addressing the opportunities and risks within the public sphere itself. The private and the social sphere of technological citizenship also constitute this dual perspective, yet for the public sphere this duality is more in the forefront. This dynamic element of the framework will be further discussed and exemplified in Sect. 3.

Empowerment, in the public sphere, concerns the ability of citizens to be aware of the opportunities of digitization and to be able to use the means of political participation to contribute to creating regulatory and institutional arrangements that enable and secure these opportunities. For example, having internet access is an important condition to function in contemporary society, while encryption and net neutrality serve as important sub-conditions that contribute to security and equality in the digital age. Citizens can, for instance, read and comment on national legislative drafts that secure the need for safe encryption, mobilize like-minded citizens to lobby for legislation that fosters public values, or vote for a party that stands for the right to internet access and net neutrality for European citizens. Empowerment, thus, refers to citizens contributing to creating the equal conditions and possibilities for all citizens to take advantage of digital technologies, in line with a 'positive rights' perspective on digital rights (Karppinen & Puukko, 2020).

Resilience, in this context, concerns the ability of citizens to be aware of and address the risks of digitization for society in the public sphere. Risks are, for exam-

ple, that technology applications such as artificial intelligence and surveillance can pressure citizens' security or privacy. Citizens can, for instance, create awareness of the misconduct by a digital technology company by protesting or whistleblowing, organize a mass action lawsuit to address a security breach caused by a lack of privacy regulations in governmental policies, or block the implementation of a bill that disproportionally increases a governments' possibility for surveillance at the expense of citizens' privacy. Resilience, in the public sphere, refers to citizens' ability to understand the risks of digitization and launch them on the political agenda to ensure that government policies and laws are sensitive to these risks.

3 Examples to Demonstrate the Technological Citizenship Framework

Summarizing, the three spheres of technological citizenship provide an integrative framework to interpret the interconnectedness of digitization's impact on society and the way in which citizens can actively shape this impact across the private, social, and public spheres. The framework enables reflection on the roles of citizens in the governance of digitization and appreciation of their actions in relation to their social or political impact.

We have mentioned before that this framework should be understood dynamically: digitization can provide various opportunities and challenges for the private, social, or public sphere, it might create tensions between different spheres, and citizens may deal with these opportunities and challenges by navigating the three spheres. By means of political participation within the public sphere, for example, citizens can deal with the challenges brought by digitization for personal privacy, social relationships, or democratic processes. But we emphasize that also by acting within the social or private sphere citizens can play a role in steering the impact of digitization on society.

In this section we discuss three examples that demonstrate this dynamic aspect of the framework. We reflect on the practice of digital detoxing, a community-based initiative for a public internet, and a citizen-led referendum against a new privacy infringing-law. For each example, we describe the impact of digitization on one or multiple spheres and how citizens actively try to shape this impact across the private, social, or public sphere. As such, these examples demonstrate the interconnectedness of and dynamics between the three spheres, emphasizing how digitization both shapes and is shaped by citizens' engagement in the digital age.

3.1 Dealing with Digital Overload: Digital Detoxing

The use of electronic devices (such as smartphones) and apps that run on it (such as social media) can exert a negative impact on its users' mental health (Ghaemi, 2020), subjective well-being (Verduyn et al., 2017), and productivity (Duke & Montag, 2017), amongst others. For example, users might develop a low self-esteem by constantly comparing oneself to others on social media, they might feel like they are wasting time endlessly scrolling, they might experience addiction to social media

apps, or they might experience overstimulation and stress due to constant notifications and the need to be 'always on'. Further, users can have privacy concerns about the devices or apps they use, or they might have concerns about the role of Big Tech companies in society. Some users seek the answer to deal with these issues within their private lives, and intentionally and voluntarily restrict the use of certain electronic devices or apps. This is referred to as 'digital detoxing' (Radtke et al., 2022) or 'digital minimalism'. These users might refrain from using their electronic device for a certain period of time, exchange their smartphone for a 'dumb phone', which can only make calls or send SMS messages, or install apps that change the layout of a smartphone to a minimalist design or limit the time a user can spend on specific apps.

Privacy or political concerns can also motivate users to quit using certain apps or to find alternatives. For example, when in 2021 Whatsapp announced a change in its terms of service, indicating that the platform would share user data with other Meta-owned companies, millions of users quit the app and started using Signal or Telegram instead as a more privacy-friendly alternative (Hern, 2021). And in 2018, in the wake of the Cambridge Analytica scandal, a famous Dutch television show announced they would leave Facebook to reach out to their audience due to the disruptive impact of the platform's revenue model on society, encouraging their audience to quit as well (which allegedly 10.000 people did).[6] Yet, restricting smartphone or social media use might create tensions with the social sphere, as it makes it harder to connect with friends and family while they might not understand or respect the motivation behind it. The challenge for these users is to stay socially connected while remaining mentally balanced.

The example of citizens who restrict their use of electronic devices or social media for health, privacy, or political motivations, demonstrates how citizens can deal with the risks of digitization for the private, social, and public sphere within their private lives. By consciously using digital technologies in their private life, citizens can shape the impact of digitization on their own private life, maintain social relationships in a balanced manner, and contribute to creating new social norms and a healthy public sphere.

3.2 Creating New Public Spaces on the Internet by Building a Community

The Dutch initiative PublicSpaces[7]—a collaboration of public organizations including public broadcasters, libraries, museums, and schools—aims to support the development and use of non-commercial public and community spaces on the internet. The motivation for this initiative is to solve the problem faced by these public organizations: they are largely dependent on Big Tech platforms to communicate and share information with citizens. These platforms are, however, primarily driven by commercial interests and therefore do not foster public values, such as privacy, autonomy and transparency. As such, using these platforms to communicate with citizens is at odds with the public objective of these organizations. Leaving those platforms, how-

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[6]According to a Dutch news outlet:https://www.rtlnieuws.nl/tech/artikel/3909411/10000-facebookers-stoppen-ermee-het-lijkt-erop-dat-dit-snel-overwaait

[7]https://publicspaces.net/english-section/manifesto/.

ever, would mean that these organizations cannot easily reach out to citizens and vice versa. The PublicSpaces initiative aims to deal with this challenge by supporting the development and use of independent public and community spaces on the internet.

A central tenet in PublicSpaces' approach is that public organizations can express the values they aim to promote by using software that reflects these values, such as transparency and human-centeredness, in their design. Therefore, PublicSpaces has developed a methodology to help public organizations make the switch to alternative software and social media platforms (such as, for example, from Facebook and X to Mastodon). Further, PublicSpaces serves as an information base about alternative software and platforms, encourages citizens to contribute new initiatives, and organizes a yearly conference to create and foster a community around this shared goal.

As such, the PublicSpaces initiative deals with the challenges for the public sphere caused by commercial social media companies by creating a community around solving this issue and promoting and supporting the development and use of publicly and socially responsible alternatives. This example demonstrates that citizens can deal with the issues caused by digitization for the public sphere by taking action within the social sphere: by uniting around a shared goal and seizing the opportunities of digital technologies, citizens in this example lay a base for a community-powered public internet.

3.3 Protesting Against Privacy-Infringement in the Dutch "Sleepwet" Case

The protection of privacy in an increasing digitizing society has been a matter of concern for Dutch citizens and has led to their political involvement. In the Netherlands in 2017, a new law[8] was introduced that expanded and specified the national intelligence services' capabilities regarding hacking and monitoring information on the internet. Unlike the preceding law, which only allowed untargeted interception of communications via the ether (radio and satellite traffic), the new law permitted untargeted interception of cable-bound telecommunications, which includes all online communication. This could have a considerable impact on Dutch citizens' privacy.

Consequently, the introduction of this law faced significant public opposition and debate. Concerned citizens and activists labeled it the 'drag-law' (in Dutch: *sleepwet*) for its net-like ability to capture vast amounts of untargeted data. A group of university students criticized the law for its far-reaching consequences for the privacy of Dutch citizens, introduced without widespread awareness. The students initiated a public debate and organized a referendum to prevent the law's implementation. A majority of voters, including activist organizations such as Amnesty International and Bits of Freedom, opposed the law. Consequently, the government was compelled to reconsider the law, which was ultimately accepted with adjustments and the condition of a two-year evaluation.

This example demonstrates that the establishment of laws and regulations to govern digitization is not a static top-down process, but that citizens play an important role in this process. Their involvement and input are crucial for developing laws that

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[8] The law on the intelligence and security services 2017 (Wiv2017).

effectively address the impact of digitization on society by striking a right balance between the protection of different values—in this case, privacy and security. The example of the protests and referendum against the 'sleepwet' demonstrates how citizens can deal with the risks of digitization for the private sphere (a looming privacy infringement) by taking action within the public sphere.

4 Conclusion: Technological Citizenship and Further Research

The concept of technological citizenship offers a novel theoretical lens to explore and understand the role of citizens in a digitally mediated society. It highlights a broad spectrum of citizen actions, from participation in public discourse to creating new online communities, thereby enriching the discourse on citizenship in the digital age. The framework of technological citizenship adds to the existing literature a holistic overview of the impact of digitization on society and the active roles of citizens in shaping this impact across all life spheres.

In this article, we have laid out the framework of technological citizenship by highlighting how digitization impacts the public, social, and political life spheres of citizens, and we have used the liberal, communitarian, and republican vision on citizenship to shed light on how citizens in each of these spheres can deal with the opportunities and risks of digitization. We have demonstrated this framework by reflecting on the impact of digitization on the private, social, and public sphere and citizens' active role in shaping this impact by discussing three concrete examples.

The concept of technological citizenship can be used to clarify, investigate, and thus provide insight into the roles of citizens in a democratic constitutional state in the digital age. This notion enables individuals to conceptualize their roles in digital societies, triggering new ways of understanding active participation and political responsibility. The goal of this framework is to guide and encourage reflection on the roles of citizens in contemporary digitized societies and to appreciate their actions in relation to their social or political impact. Understanding actions under the umbrella of technological citizenship enables better recognition and appreciation of such actions.

Traditional notions of citizenship are often conceptualized in a manner that overlooks the transformative role of technology in societal dynamics. Technological citizenship recognizes that digital technologies are not merely tools but active agents that reshape the fabric of civic life. For instance, social media doesn't just offer a new channel for communication; it alters the scale, speed, and scope of public discourse, creating new public spheres and forms of political mobilization that were previously unimaginable. To develop the argument that technological citizenship is not just a theoretical construct but a necessary evolution of citizenship in the digital age, the article shows that, e.g., without recognizing the unique challenges and opportunities presented by digital technologies, traditional notions of citizenship fail to equip citizens with the tools and knowledge they need to participate fully in digital societies. This gap undermines democratic engagement and social cohesion in an increasingly digitized world.

This paper lays the groundwork for a more precise exploration of technological citizenship and its implications across the private, social, and public spheres, paving the way for future research that could further expand on this foundational concept. This framework is, therefore, valuable for further research on safeguarding private, social, and public values in the digital age, as it enables researchers and policymakers to find ways to facilitate citizens in their different roles to safeguard values in the digital society. The model underscores the importance of empowering citizens to navigate and shape the digital landscape across all spheres. By fostering digital literacy, encouraging civic engagement, and supporting community initiatives, policies can strengthen citizens' capacity to mediate the tensions between their individual rights, communal interests, and the broader public good. For example, in the case of digital detoxing (Sect. 3.1), citizens might want limit their use of electronic devices to reduce stress, but if their work requires them to be 'always on', this is impossible. Policymakers could, for instance, support citizens in this case by implementing policies that forbid employers to request connectivity outside work hours.

Overall, the dynamic perspective offered by the model suggests that rigid, one-size-fits-all policies may not be effective in addressing the complex realities of technological citizenship. Instead, it advocates for flexible, adaptive policy frameworks that can respond to the evolving interplay between private, social, and public interests, ensuring that regulations remain relevant and effective in balancing diverse needs. Further research, in particular in-depth case study research, can explore in more detail how citizens' empowerment and resilience in the digital age can be facilitated and supported.

Data Availability The article does not have any associated data, because our work proceeds within a theoretical approach.

Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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