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The dilemmas around digital citizenship in a post-Brexit and post-pandemic Northern Ireland: towards an algorithmic nation?

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ABSTRACT

Northern Ireland (NI) has pervasively been a fragile and often disputed city-regional nation. Despite NI's slim majority in favour of remaining in the EU, *de facto* Brexit, post-pandemic challenges and the Northern Ireland Protocol (NIP) have revealed a dilemma: people of all political hues have started to question aspects of their own citizenship. Consequently, this article suggests an innovative approach called 'Algorithmic Nations' to better articulate its emerging/complex citizenship regimes for this divided and post-conflict society in which identity borders and devolution may be facilitated through blockchain technology. This article assesses implications of this dilemma for a city-regionalised nation enmeshed within the UK, Ireland and Europe. This article explores digital citizenship in NI by applying 'Algorithmic Nations' framework particularly relating to intertwined (i) cross-bordering, (ii) critical awareness, (iii) digital activism and (iv) post-pandemic realities and concludes with three dilemmas and how 'Algorithmic Nations' framing could better integrate NI's digital citizenship.

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Introduction

The uneven algorithmic advances across geopolitical boundaries experienced in the current technological epoch are profoundly changing how pandemic citizens connect, engage, discuss and explore their identities and realities (Bridle 2016; Calzada 2021a, 2020c). At the heart of this activity is a growing proliferation of investment and deployment of the so-called smart city framework, articulating artificial intelligence (AI) and programmatic machine learning towards harnessing elements of human experience in ways that reach further, faster and far beyond previous notions of media actions through private interests bypassing citizenship concerns (Calzada 2021b; Kim et al. 2018).

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Amidst the perils and promises in the uptake and the adoption of these algorithmic technologies for city-regional tensions and dilemmas, more democratic, open and transparent digital processes could provide potential of disintermediation towards empowering citizens. This is particularly the case in endeavours of commerce, democratic participation, social interaction and freer and fairer financial systems, supporting wider freedom of expression, even beyond the aftermath of post-conflict city-regional nations as is the case of Northern Ireland (NI; Graham 2011; Richmond and Visoka 2021). As such, NI is impacted through city regionalism (Calzada 2015), which can be best understood through the heuristic of geopolitical rationalities where, through increasing urbanisation, data governance structures are devolving even further, driven by economic policy (Jonas and Moisiso 2018). As an example, the city region is set to benefit from significant investment in its major cities as part of the UK City Growth Deals (Waite and Morgan 2019). These deals are enacted as part of the UK Government's Localism Act (2011) and cities are set for an economic boost as part of this process, including Belfast as well as Derry/Londonderry and Strabane (NI Assembly 2020). Consequently, citizen boundaries have been increasingly loosening at a sub-political level through metropolitanisation and datafication/digitalisation towards a more liquid and deterritorialised experience of citizenship.

Hence, this article aims to examine NI in its context as a city-regionalised and an increasingly metropolitanised nation enmeshed within governance frameworks involving the UK, Ireland and Europe and how it is evolving and may evolve in a post-Brexit and post-pandemic context (Hayward and Phinnemore 2021). Consequently, the research question of this article focuses on how the *algorithmic nation* conceptual assemblage (Calzada 2018a) may help to frame current dilemmas in NI by employing technology such as blockchain to deal with challenges associated with digital citizenship in the post-pandemic period. As a working hypothesis, this article argues for consideration of NI's future framed as an *algorithmic nation* where such framing would better devolve and modify governmental logics catalysed through more open governance at the technopolitical and metropolitanised city-regional level (Calzada 2018b).

Before establishing why, the context of the *algorithmic nation* and the topic of digital citizenship is of interest in the Northern Irish context and why it is an important case in emerging conceptions of the digital citizen, there are four substantial contextual insights that this article preliminarily suggests. These assist in focusing a better review of the overall case of NI in its consideration from the geo- and technopolitical standpoint as an *algorithmic nation* (Anderson 2018; BBC 2021a).

First, since 1998 and the signing of the Belfast (Good Friday) Agreement (Soares 2018), NI has seen 27 years of relative stability in a post-conflict period following what was historically referred to as 'The Troubles' (1998 Agreement, April 10).

Second, critical to issues of citizenship, the agreement established the framework through which further devolution of powers to a local assembly was facilitated, providing a basis for localised solutions to issues of governance in a manner that facilitates power sharing (Birnie and Brownlow 2016; Brownlow and Budd 2019). This ability to preside and execute legislative functions at a devolved level and within key aspects of EU structures, through the UK and Ireland's common membership, provided a mutual basis in law to support this devolution opportunity (Hayward 2018; Morrow and Byrne 2016; UK Government 2020). A further stimulus to stability in the Belfast Agreement was

envisioned via an NI Civic Forum, which was not reconstituted after an early collapse of NI's institutions in 2002. Indeed, strand 2 of the Belfast Agreement also proposed an all-Island independent consultative forum, which is also not yet developed as an outworking of agreements made in 2006 to restore power sharing known as the St Andrews agreement (Nagle 2018). Unfortunately, with consequences for stability in NI, the rhetoric and narrative to *take back control* voiced around the UK referendum on European membership has had far reaching implications and reinvigorated a sectarian focus fuelling varying perceptions of the direction of NI as a devolved city-regional nation (Gordon 2016; Murphy 2021). Consequently, digital citizenship challenges current interpretations of fixed borders and the ethos of taking back control, despite the fact that technology could also be used for certain political agendas. The *Algorithmic Nation* framework holds that citizen realm should be entirely sovereign to exercise the right to decide the political future of the nation as an outcome of deliberative democratic discussions rather than agendas necessarily imposed by politicians.

Third, by a narrow majority (51.9% to 48.1%), the UK voted to leave the European Union. The ramifications for the remaining vote in NI and Scotland were significant – in NI, there is a sense for many of *waking up in a different country* due to the destabilising effect of losing the commonality and comfort of integration through European structures across the entire Island of Ireland (Gormley-Heenan, Aughey, and Devine 2017; Gormley-Heenan and Aughey 2021; Heenan 2021; Morrow and Byrne 2016). There are a majority who are still rooted as European in terms of their identity (Reilly 2021) and as regards, their sense of citizenship in what might be described as unfurling post-Brexit nationalistic divisions. In terms of digital citizenship, this fact poses multiple intertwined consequences for citizens since the pandemic, particularly regarding datafication processes in which they are unwittingly involved in and surveilled by.

Finally, added to these post-Brexit and post-pandemic realities, citizens in NI are further challenged by the impacts of COVID-19 and its implications. In NI, it posed challenges not only to health but also to the political stability and peace of the society, where repercussions were amplified due to the implementation of new Brexit trading arrangements. This was particularly inflamed following the debacle of UK-Euro management of vaccine accessibility caused due to what Hervey et al. suggest as health 'Brexternalities' (2021). The threat to embroil NI as a process option in this political fallout around vaccine access within the EU was regrettable, particularly through the newly established Northern Ireland Protocol (NIP) (Hayward and Phinnemore 2021; Duparc-Portier and Figus 2021).

Following the above (i) introduction, (ii) in the next section, this article presents the case of NI. Thereafter, (iii) this article explores the nexus between the algorithmic nation and digital citizenship through four intertwined frameworks (cross-bordering, critical awareness, digital activism and the post-pandemic lens). (iv) In the fourth section, this article responds to the research question on how the *algorithmic nation* conceptual assemblage may help to frame current dilemmas in NI relating to challenges associated with digital citizenship in the post-pandemic period. (v) In the final section, this article concludes summarising three key dilemmas and points out future research avenues.

Context: the case of NI

The Good Friday Agreement of 1998 can be seen as the outworking of much effort to secure peace and stability in a city region fraught with political violence since its inception (Calzada 2015; Duhart 2017). This internationally endorsed British-Irish agreement established a framework for the management of issues of sovereignty, which were overwhelmingly accepted in both NI and Republic of Ireland (RoI) through referenda (Hayward 2007). This put in place the procedures to establish new institutions and processes to support the agreed status of NI and towards the implementation of the agreement coupled with decommissioning by combatants also. All was founded and based on the core principle committing to ‘the mutual respect, the civil rights and the religious liberties of everyone in the community’. A critical strand to the success of this agreement was the enshrinement of the European Convention on Human Rights into law in NI, providing citizens with access to the European Court of Human Rights (Lagana 2020).

In early 2021, the challenges of maintaining the stability developed after Belfast agreement have seen difficulties due to the outworking of Brexit, which were acutely felt by citizens across NI (Teague 2019). As will be evident in the following discourse, there are many and diverse identity forms that can be taken within the city-regional and technopolitical construction of NI with much variability in terms of cross-border citizenship (Calzada 2018a; Gormley-Heenan and Aughey 2017). This is even further exacerbated as a result of Brexit with real and perceived, technical and geopolitical facets of citizenship further in flux based on personal notions of nationhood. This trend is currently shaping and producing a significant number of trackable daily geoeconomic routines through more limited post-pandemic cross-bordering patterns of citizens surveyed through technology and datafication processes (Kampmark 2020). NI is becoming more city-regionalised and increasingly metropolitanised nation but is developed on fracture lines across a historically disputed territory within the UK. Although there is an agreed form of governance established and developing as part of the Belfast Agreement, it is one in significant flux as much in need of stabilising approaches. *Algorithmic Nation* as a conceptual city-regional and technopolitical conceptual assemblage provides another complementary angle to this analogic vision.

From the geodemocratic perspective, citizens of NI have the right to dual nationality so can technically be British, Irish or both as a result of the Belfast Agreement. According to Garry and McNicholl (2015, 2), in NI, ‘twenty-seven percent of Catholics and twenty-nine percent of Protestants feel *Northern Irish*’, which can be considered an indicator of a more liquid or deterritorialised approach to citizenship and towards a more civic nationalism as previous research suggests (Calzada 2018b; Dempsey 2020). It argued that ‘when compared to the more traditional Irish and British identities, this new national category is more closely related to moderate party preference’ (McNicholl 2019, 44).

This is further evidenced through voting patterns in NI, which has shown some interesting sociological shifts in recent years particularly since the Brexit referendum in 2016 and polling since the subsequent deal in December 2020. The most recent general election to the UK parliament has seen the highest vote for ‘others’ beyond ethnic nationalist preferences becoming a new political centre. Elections to the European

NI European Elections Voting Patterns in 2009/2014/2019

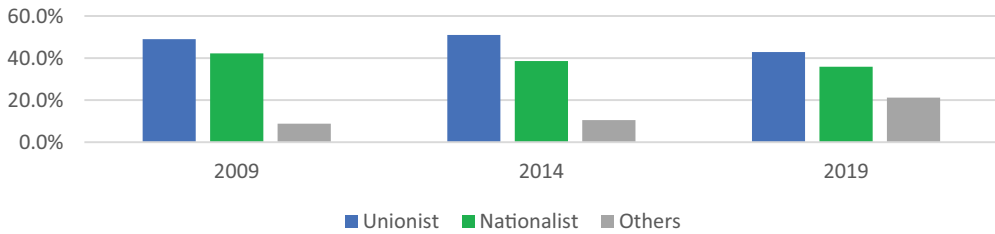


Figure 1. NI European election voting patterns in 2009/2014/2019.

parliament are also interesting when considered against this backdrop regarding unionist, nationalist and others where we see that ‘others’ has risen considerably to 21.2% of voting by 2019 from a low of 8.8% in 2009 (see [Figure 1](#)).

This growing and mainly metropolitanised group is less likely to vote in polarised ways and seek a third pathway, less dichotomic and binary (neither unionist or nationalist) and with a more centrist civi-ally aligned focused (Tonge 2020). This is an important element of emerging political and cultural logics given the impact of Brexit towards exacerbating ethnic nationalist perspectives and stances. The emancipatory approach of civic and metropolitanised nationalism may well provide the necessary approach to a more balanced, inclusive and less binary consideration of sovereignty relating to the right to decide of citizens in the NI context. Particularly, the political discourse continues around how to decide future solutions amidst the UK/EU dilemma and broader Irish discourse on unity (Garry et al. 2020; Calzada 2018b; Hayward 2020).

The growth of ‘others’ in NI ([Figure 1](#)) where the majority of these voters seek accommodation and a more civic nationalism also fuels creative thinking towards more innovative and inclusive forms of nationhood, seeding important opportunities to propose digital approaches such as framed by algorithmic nationhood (Calzada 2018a; Hayward and McManus 2019). NI has a requirement for a model of dual nationality and interdependence within and between regions, states and to some extent, within an EU supranational configuration. New democratic mechanisms enabling and honouring citizens’ multiple national identities through digital means could further underpin regional stability. This could be achieved through a more bottom-up integration and further decentralised in terms of decision-making processes by encouraging *digital citizens* to participate. Such broader forms of citizen participation and integration of citizen voice as a means of better supporting democratic processes were highlighted by a number of politicians and policy makers as an opportunity and critical strand to assuring progressive politics, peace and stability in NI (University of Liverpool 2019). In a recent survey of 34 members (MLA’s) of the NI’s 90 strong Legislative Assembly, it is agreed (56% vs 21%) that citizens’ assemblies could offer useful insights into public views; however, they were more sceptical of tackling more complex issues (Garry et al. 2021).

There is support in NI for digital literacy, but many citizens could be better engaged in their political aspirations beyond social media, in a more meaningful way (Doyle 2019). Dialogues around algorithmic decision-making and its challenges may well create the opportunity for a third way to emerge, where a more liquid form of nationhood develops to support stability, peace and prosperity moving forward. The cross-bordering challenge might show a path towards experimentation with further porous geographies while allowing citizens to choose their citizenship status within broader state-national contexts, meaning post-Brexit UK and Ireland being less the focus than the important issues of economy, health and welfare (Nadalutti 2014).

As such, NI's challenge, and thus dilemma, is in resolving its post-Brexit position for its citizens with consideration for new governance attributed to the NIP. The protocol requires NI as the only part of the UK to remain within the EU's customs Union for certain goods. It goes without saying and this is the direction of this article; this new governance dilemma is the critical focus for pandemic and increasingly more digitalised citizens in NI. As such, the potential for digital technology to maintain pluralism and to offer democratic participation equally may serve to extend politics and technology to its benefit. These emerging geopolitical arrangements further provoke citizens' digital consumption patterns, specific preferences, and manners of interacting with other citizens.

Rationale: algorithmic nation and digital citizenship nexus

With a better grasp of the underlying geopolitical tectonics at play in NI, this article now considers the concept of the *Algorithmic Nation* as a potential framework to the ongoing challenges of a post-Brexit and post-pandemic NI. In this similar vein, Whysall (2021) shares the imperative for a reinvention of processes in NI's political system and advocates for academic and third-sector organisations to go beyond analysis and to offer policy prescription. By supporting proactivity in the civic society, *Algorithmic Nationhood* could offer an important framing for the emerging geopolitical and geotechnological logics impacting NI citizens.

Algorithmic Nationhood is presented by Calzada (2018a) as a growing movement of experimental geotechnological activity, where small states (e.g. Estonia, New Zealand, or Iceland) or even active stateless city-regionalised nations (e.g. Catalonia, Wales, Scotland, the Basque Country, Quebec or Flanders) invigorated by their urban hubs' (e.g. Barcelona, Cardiff, Glasgow, Bilbao, Quebec or Antwerp) attempt at modifying governmental logics (Calzada 2022). This is achieved through devolving power catalysed through open governance initiatives based on new technologies such as AI and blockchain to enable more direct interactions with citizens (Data Justice Lab 2021). More explicitly, Calzada (2018a, 270) defines an *Algorithmic Nation* as '(i) a non-deterministic city-regional and technopolitical conceptual assemblage (ii) for a transitional strategic pathway (iii) towards the nation-state rescaling (iv) through three drivers – metropolitanization, devolution and the right to decide'. This process can be argued to bring renewed value at both the governance and the citizen level by enabling new city-regional and technopolitical patterns to emerge and support a more nuanced perspective of devolved governance further protecting and enshrining future aspirations on the right to decide as a component of a negotiated strategic approach by devolved powers (Bridle 2016; Calzada 2018a). Furthermore, the post-pandemic era might have opened up an

unprecedented number of datafied interactions with citizens that contain valuable insights from the digital citizenship perspective insofar as it refers to personal data policy and manners to arrange policy instruments at a city-regional level (UK Government 2021; Calzada 2021c). Several experimental approaches are being considered to support better management of such data in other European contexts where cross-bordering of the digital citizen is a significant consideration in terms of social impact (Al-Saqaf and Seidler 2017). Citizens may also be early adopters and adapters of digital opportunities and the adoption of certain technologies could equally be understood as a political act or as a democratic expression in itself (Calzada 2018c).

One such approach is through leveraging blockchain technologies, which are a novel distributed ledger approach to support digital transparency, that ‘secure, validate and process transactional data’ (Engin and Treleaven 2019, 450). Beyond blockchain’s meteoric rise in application in the revolutionary, distributed management of cryptocurrencies, it has been positioned as a potential means to support a more democratic application towards several data management governance processes. This offers auditability and evidence through more transparent record keeping (where appropriately managed through legal structures/frameworks), offering real-time transaction transparency through the distributed nature and management of database information such as that of citizens (Piao et al. 2021). Examples of its application in governance approaches are further explored later with notable success in a European cross-bordering context in Estonia (Calzada 2021e; Willems 2021). Datafication advances in the public realm at pace and thus necessary framing of the rights of digital citizens in this expanding digital paradigm require frameworks to focus governance for all citizens (Calzada 2018c; Engin and Treleaven 2019).

The appetite for different engagements with citizens (i.e. citizen assemblies) as supplements to representative democracy through digital technologies is at the core of the notion of *Algorithmic Nation*. In post-pandemic times, ordinary decisions and opinions around pandemic citizens’ lives have been proved to be more dependent on real-time measures (i.e. COVID passports; Calzada 2021e, 2022). *Algorithmic Nation* offers a deliberative democratic framework to experiment based on digital citizenship while anticipating highly biased urban environments where digital and data divisions pose growing inequalities. It goes without saying that the surveillance extractivist effect should be subverted at the local level by digital platforms ensuring a certain level of data sovereignty (Calzada 2021c). A way to implement digital literacy measures amongst key cohorts of the community (i.e. age, class, race and gender issues) in *Algorithmic Nations* is being currently experimented through data co-operatives and digital rights advocacy in several global ‘people-centered smart cities’ (Calzada, Pérez-Batlle, and Batlle-Montserrat 2021).

Underpinning algorithmic nationhood is the requirement for citizen engagement through the digital paradigm and as such, enablement of digital citizens is foundational in support of the *Algorithmic Nation* conceptual assemblage (Calzada 2018a). In the modern context, authors such as Choi, Glassman, and Cristol (2017, 111) highlight that digital citizenship ‘should be more globally aware, more critical and more concerned with goal-oriented participation beyond traditional boundaries’. Hence, there are a myriad of themes contested as critical measures of digital citizenship (e.g. data sovereignty, digital rights, divide, literacy, access and security). In the context of this

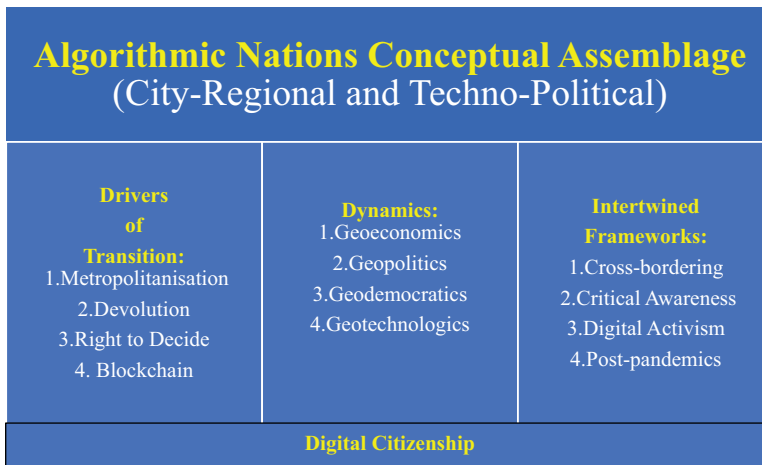


Figure 2. Algorithmic nation and digital citizenship nexus in the NI (adapted from Calzada 2018b and applied to the case of the NI).

article, the focus is narrowed to elaborate more on how ‘cross bordering’, ‘digital activism’, ‘critical awareness’ and ‘postpandemics’, as intertwined frameworks, can be supported in emerging and emancipatory *Algorithmic Nations* rationale. This focus may empower more inclusive communities in the formulation of new approaches in relation to rescaling processes within nation states in this post-pandemic reality (Calzada 2018d, 20222022).

Figure 2 presents a framing of the overall concept of the *Algorithmic Nation* and its nexus with digital citizenship. The *Algorithmic Nation* conceptual assemblage, as presented, is related to a more cohesive understanding of digital citizenship through four intertwined frameworks. These are focused by the dynamics of the geoeconomic, geopolitical, geodemocratic and geotechnological as well as the drivers of transition impacting the *Algorithmic Nation* including metropolitanisation, devolution, the right to decide and blockchain (Fernández-Prados et al. 2021; Phinnemore et al. 2021). These intertwined frameworks are related further in the following subsections:

(i) *Cross-Bordering*

The first intertwined framework of cross-bordering offers a useful nexus to integrate the digital citizen more clearly into the conception of the *Algorithmic Nation* and will be explored further in the case of NI, particularly given the clear linkages to the key drivers of *Algorithmic Nations*. These drivers of transition – metropolitanisation, devolution, right to decide and blockchain – consider digital citizens as enablers in emerging governance assemblages. This is particularly evident in NI’s post-Brexit and post-pandemic reality and is important to countenance as a means to develop and enable better discourse and improve collective decision-making on cross-cutting issues faced post-Brexit and post-pandemic (Anderson 2019), particularly where the current structures are in jeopardy of collapse (BBC 2021b). Taking an even broader view, more inclusivity of digital citizens in discourse and dialogue in governance issues is particularly

important given the trends and growth of algorithmic decision-making across public sector contexts globally and with the increasing impact in the UK and Ireland (Al-Saqaf and Seidler 2017). Thus, it is proposed that approaches that support better engagement and reduce the potential of data-driven technologies in disadvantaging digital citizens and marginalising people disparately are considered (Butler 2019; O’Neil 2016; Calzada 2018c).

Cross-border citizenship, such as contained in citizen rights as members of the EU, has been a further catalyst to change in many contexts that can be understood in the framing of *Algorithmic Nations*. Several *Algorithmic Nations* can be considered to apply or considering applying such logics to better engaging their citizenry (Bridle 2016). Estonia is a key European example where functionalities and systems are enabled through technology to support wider partnership in e-governance so as to deliver important public services digitised more securely through blockchain technology such as tax, ID, voting, cyber security, cross-border data exchange and e-health, to name a few of its outworking’s (Al-Saqaf and Seidler 2017; Willems 2021). This dynamic form of geotechnologically enabled governance is warranted in cases where there is a will to explore citizenship in broader terms encouraging more universal values, such as equality and diversity, somewhat in contrast to forms of ethnic nationalism, which tends more to draw on race or history to set the nation apart (Calzada 2018b). Indeed, even in the example of e-Estonia, there is still a more liquid approach required towards supporting ‘stateless’ inhabitants who see themselves apart in order to assure stability at a sub-regional level. Consider the significant Estonian Russian speaking population, which highlights the necessity for a more holistic and inclusive framing of what nationhood is (Calzada 2021d). In the context of NI, cross-bordering (physical, virtual, perceived and real) is still a reality and therefore requires broader framing and growth in awareness (Border People 2021).

(ii) *Critical Awareness*

In the context of this article, the second intertwined framework refers to ‘critical awareness’ defined by Fernández-Prados et al. (2021) as a combination of critical perspective and local/global awareness. This ‘critical awareness’ in these post-pandemic times is of the challenges of cross-bordering, particularly given the impact on areas such as health, economy, security, migration and in sociocultural contexts also. In the NI context, this is potentially more exacerbated from a digital citizenship perspective when reflecting on the growing tensions around the NIP (Phinnemore et al. 2021).

Critical awareness therefore first relies on underpinning through the technical skills to exploit modern information flows towards engaging and understanding the realities and the discourse around people. Second, it is critical to stimulate awareness of this discourse and to grow more balance in perspective on these realities at both local and global level (Choi, Glassman, and Cristol 2017). Related aspects at this foundational level of digital citizenship are enablement through local/global awareness as well as engagement in critical perspectives. Enabling a more critical perspective supports the potential to develop better participation through related activities such as digital activism. Digital Activism, which is discussed next, combines the dimensions of online civic engagement

as well as the opportunity to participate in internet political activism and is an important logic, particularly for city-regional contexts and transforming nations such as NI (Calzada 2018a).

Critical awareness in the digital citizen context frames a myriad of considerations at the nexus with *Algorithmic Nationhood*, particularly as technology becomes further integrated into governance practice and intra-national approaches for the increase of metropolitanisation (Calzada 2018b). As an intertwined construct, critical awareness is important in framing devolution in the NI context, where the Belfast Agreement contains three strands, in which two are focused on forms of cross-border relationships (North/South and East/West beyond UK/RoI). These cross-border relationships aim to underpin a more stable society through localised management of critical issues of citizenship and identity previously at the heart of conflict in NI (Teague 2019). As such, devolution in NI through the Belfast Agreement has opened an important pathway to legislative control over key social and economic or transferred matters. These include health and social services, education, employment, justice, policing and a further ten key policy areas. The challenge to increase critical awareness at a local level could be enhanced through structures that better enable new forms of engagement in the technopolitical paradigm through digital activism within *Algorithmic Nationhood*. Such structures engage civic organisations in experimental approaches and new logics as those involving citizens engagement suggested by Whysall (2021).

(iii) *Digital Activism*

The third intertwined framework refers to ‘digital activism’ – combining internet political activism and online civic engagement, incorporating new forms of digital participation. According to Fernández-Prados et al. (2021, 466), ‘social and political activism is one of the pillars of a country’s political culture and democratic health’. It is apt therefore from the perspective of the digital citizen and with consideration of the *Algorithmic Nation* framing that this theoretical lens considers the dimension of ‘digital activism’. This is an important consideration in framing modern democracy from the important and evolving perspective of the more datafied society (Fernández-Prados et al. 2021).

Digital activism has been construed as critical resistance, as themed in Choi’s (2016) study of digital citizenship, which can be considered through emerging themes of ‘recognition of power structure’ and ‘resistance’ through political activism where digital citizens use online resources to engage in what they see as digital rights to ‘challenge previously unchallengeable institutional power structures’ (Calzada 2021f; Choi 2016, 582). The internet has historically been a vehicle to fuel digital activism through cause orientation and via civic and political activism. This has generally strengthened civic movements and their interest groups in a manner more impactful than through conventional channels of political participation as structured through voting, party politics and/or campaigns at election time.

More recently, internet-enabled algorithms and AI have become a challenge and a threat to internet-enabled democratic will, where influence and power have been focused, targeted, and executed in manners so as to potentially influence the outcomes of election processes through powerful AI-enabled voter targeting and acquisition

schemes (Calzada 2018a). This has been on a scale previously unimaginable to the point that there are now justified calls from the scientific community to consider how such technologies can be used to support and strengthen democratic processes as opposed to undermining them (Nemitz 2018). It is in this regard that human-centred digital activism has become a much more important ingredient to assure public involvement in underpinning sound democratic process (Fernández-Prados et al. 2021).

Thus, to enable *digital activism* through internet-enabled political activism and to support online citizen engagement, secure tools and processes that are more *platform agnostic* and open are critical. This assures that a more balanced, accountable and secure dialogue to develop discourse is warranted (Choi, Glassman, and Cristol 2017). Although blockchain and similar database-driven technologies are being adopted to secure supply chains and support authentication processes of e-citizens, technology in general faces a level of mistrust in democratic processes, in particular, when related to e-democracy and e-government (Taş and Tanrıöver 2020). This is mainly due to the challenge of maintaining voter anonymity and their right to be free in their decision-making whilst also having a record or receipt (such as a ballot) to support vote management where further scrutiny is required (Bravo, Balcells, and Padró-Solanet 2019). It is clear that without evolving new governance approaches (such as leveraging blockchain), which are more transparent, the foundational logics to support more engagement in geopolitics through digital citizenship will falter.

Although successful, however, digital activism has been affecting city-regional deliberative dynamics over the last few decades by creating a sense of active community-driven resilience. Among several cases, as a significant approach to supporting democracy, Barcelona provides an excellent example of how more ‘people-centered smart cities’ and a socially innovative approach can be taken (Calzada, Pérez-Batlle, and Batlle-Montserrat 2021). This can support digital activism in the context of healthy regional democratic practice (Calzada 2018c). Through the adoption of an e-democracy approach and utilising a digital platform (Decidim—translating to ‘we decide’, MetaDecidim and Decode strategic triad of initiatives), integrated with more traditional forms of offline civic engagement, Barcelona’s approach has developed new forms of citizen participation in civic debates and planning processes and is significant to the region’s budgeting processes also (Calzada 2018c; van Den Bosch 2018; Charnock, March, and Ribera-Fumaz 2019). This strategic triad has engendered an increase in participation of ‘netizens’ developing policy through collective assemblies and consultations with 70% of proposals coming from the citizenry (Graham 2011; Reimer 2020).

(iv) *Post-pandemic*

The post-pandemic realities of citizens across the world have been impacted by new logics, which have reduced mobility, created new professional working dynamics, increased health fears and created anxiety and other life uncertainties (Kampmark 2020). These concerns can also be seen as drivers of challenges related to digital citizenship such as increased algorithmic exposure (e.g. track and trace apps) and issues of privacy of data as well as deeper socioeconomic vulnerabilities caused by economic uncertainty (Calzada 2021b, 2021d).

To illustrate this fourth intertwined framework more explicitly, the case of Radox Engineering, as accessed by NI citizens for its services, is useful as a post-pandemic guide to the digital citizen's challenge in a post-Brexit reality. Headquartered in NI, Radox is a company at the forefront of the UK government's actions at addressing the pandemic through their COVID-19 testing procedures. Like many organisations in NI, Radox is facing the potential of significant disruption to its supply chain should post-Brexit realities begin to cause increased export/import administration at this contested EU/UK frontier. This potential threat is significant as it relates to Radox's ability to facilitate its COVID-19 rapid testing processes across city regions and nation states where trade flows and citizens' biometric data are embroiled in geopolitical technicalities. This potential threat to supporting the digital citizen in their post-pandemic health and cross-bordering activities is one of the several cases identified as opportunities to be resolved through framing in the context of the *Algorithmic Nation* conceptual assemblage for NI.

Discussion: NI, towards an *algorithmic nation*?

This article has been exploring how the *Algorithmic Nation* conceptual assemblage (Calzada 2018a) may help to frame current dilemmas in NI by employing technology such as blockchain to deal with challenges associated with digital citizenship in the post-pandemic period and the intricacies of a post-Brexit NI. As has been identified, there are several critical facets of the *Algorithmic Nation* concept, which offer the impetus for further exploration, specifically, the devolved nature of governance, the need to manage the 'right to decide' dialogue/logistics and a growing metropolitanisation in the city-regional dynamic. It is now argued that developed on these foundations, a reinvigorated NI governance assemblage empowering digital citizenship through city-regional, government and supra-national stakeholders could engage to consider things from the dynamic and unique perspective of this post-pandemic reality. As supported by several civic society organisations, revitalising the trans-national bodies created as strands 2 and 3 of the agreement through this framing could co-create opportunities to engage in new approaches. To leveraging the assemblage of cross-border institutions – North/South and East/West – to address current and future logistical issues, whilst engaging digital citizens is certainly warranted and if focused on using technology such as blockchain to resolve key NIP issues, likely to be a welcome development (Garry et al. 2021; Whysall 2021). We argue for (digital) citizens engagement in an NI Civic Forum (as envisaged in Strand 1 of the Belfast Agreement) as an opportunity to refocus and rejuvenate local governance as it has in other jurisdictions. For instance, the Preston Model (Data Justice Lab 2021) and other widespread and traditional co-operative models have strong potential to develop data sovereignty such as Mondragon Co-operative Corporation in the Basque Country (sharing with NI a similar post-conflict aftermath and an opportunity to wisely reorient the future towards an inclusive one) (Calzada 2013).

This approach could also be critical to breaking the negative socioeconomic cycle in NI going forward. This more open and transparent civic engagement and support for wider digital activism could nurture geopolitical development in this post-pandemic context where citizens become empowered through forms of e-democracy within framing as an *Algorithmic Nation* (Bea 2016). Critical to this success is having open 'human-centric accountable and transparent data-driven decision-making and governance',

which requires involvement of a broad range of stakeholders supporting design and implementation of systems being viewable through the lens of anti-discrimination and fairness (Calzada 2021b; Lepri et al. 2018, 14).

A growing 'third way', where a more pragmatic civic nationalism could seek to remedy the issues such as those of the NI protocol nurtured through a balancing of *Algorithmic Nationhood*, may offer renewed hope for political stability (Whysall 2021). Applying such governance logics as has been successfully applied in other city-regional areas such as through blockchain has been seen to enable better interoperability, openness and cross-bordering compliance (Gat 2018). This approach could be harnessed to assure less friction in the implementation and management of economic, political, and social policy between the UK and Europe where NI and its ports are the hub for such transitory activity (Calle et al. 2019).

Through the assemblage of institutions supporting the devolved NI Executive (North/South and East/West), a reinvigorated *Algorithmic Nation* could seek the involvement of stakeholders (BBC 2021a) to nurture a Digital NI ecosystem to rival regions such as Singapore, given NI's unique positioning in terms of linking the UK, Europe and rest of the world. Leveraged through the Irish diaspora, NI is a 'rare issue of bipartisan consensus' (Borger 2021), which may offer increasing potential of investment. Indeed, previous policy has focused on leveraging linkages with North America and Europe through key strategic all Island projects such as Project Kelvin, providing economically driven opportunities to engage stakeholders in sourcing foreign direct investment through 'a number of key strategic projects that if realised would significantly enhance NI's position as a Knowledge Economy' (Invest NI 2019, 4).

With NI's increasing metropolitanisation, coupled with devolution, and an impetus within the Good Friday agreement to support a 'right to decide' mechanism in the future, integration of the digital citizen into decision-making is imperative. Critical to the success of such an approach is the acknowledgement of a more liquid or de-territorialised citizenship that can support cross-border citizenship in UK, Ireland and EU contexts (BBC 2021c). Adopting a civic nationalist approach opens up opportunities to support and coexist citizens in digital capacities to better represent their preferred citizen context. Consideration by EU and UK of methods to reduce frictions emerging from the NI protocol offer experimental opportunities to test new approaches through smart cities framing at a city-regional level and within facilitative networks of stakeholders such as those which Belfast, Newry, Derry/Londonderry and Strabane are already engaged in through Island wide experimentation (Eleftheriadou, Hartog, and Gkiaouri 2021; ICC 2020). Critically, digital access through blockchain technology such as those being considered in the important Irish agri-food industry provides an important driver of solutions development in the post-Brexit and post-pandemic scenario and could offer an opportunity for better cooperation across the supra-national, national and city-regional contexts by leveraging algorithmic influences such as blockchain (MacCauley 2021; Deloitte 2018). Doing so could support digital citizenship opportunities such as e-citizenship and e-democracy. Increasing the integration of citizens into dialogues on governance issues (Heller 2017; Simmons et al. 2018) through an online offer and delivery of public services could prove to be successful given the digitising influence of the pandemic.

It is argued here that the increasing tensions of civic and ethnic nationalism in the NI context can be better managed through innovation in e-democracy approaches as has been seen to work in *Algorithmic Nation* contexts. A focus through an e-democracy platform supporting online civic engagement and digital activism integrated with traditional governance approaches, citizens' assemblies, deliberative democratic mechanisms and civic forums could catalyse civic discourse in addressing critical emerging issues of importance to all citizens such as declining health services (Connolly 2021). As part of the G20 Global Smart Cities Alliance, Belfast is a pioneering policy in the ethical use of smart city technologies and thus is in a strong position to experiment and share practice in integrating further innovative approaches to the emerging challenges of governance in *algorithmic nation* contexts, where technology such as blockchain and the IoT is delivering new citizen value (May2020).

Offering a glimpse of the possible, through a cross-bordering lens, closer consideration of Radox Engineering offers an interesting perspective of post-pandemic management of processes and products across developing frontiers. Radox is a biomedical group with companies globally but headquartered in NI and the USA. Radox's supply chains traverse the globe and their important biometric products require increasingly more secure processes for the integrity of their supply and to fulfil their application. For example, the significantly scaled up post-pandemic activities of the organisation's testing procedures in support of UK government action towards containing Coronavirus is an interesting case study relating advanced technology application in the post-Covid context – e.g. PCR Test, Antigen test or 'test to return' kit. These tests are linked to the issuing of the EU Digital Covid certification and NHS Covid Pass/Vaccination Certificates/Passports for secure travel. They provide an excellent example of how geotechnological, geoeconomic, geodemocratic, and geopolitical approaches can support *Algorithmic Nation* assemblages in securing vital services across cityregions and borders in post-pandemic contexts. Radox continues to manage samples for laboratory testing and reporting across several different geographies and city-regions throughout the UK – NI, Scotland, England, and Wales – often through Ireland – via Radox Teoranta in Donegal – and also within and across boundaries of Europe and the rest of the world. This is achieved using a unique reference number (URN) to register a test sample and to manage it. Database technology supports its transition through the supply chain where the sample traverses many borders and is accounted for throughout the journey thanks to supply chain technologies. With Singapore now using blockchain for the verification of test results, a positive picture emerges of the potential for logistical issues related to digital citizenship to be securely managed. In this particular case, the post-pandemic issues of evidencing health for travel shed light on an ever-expanding range of potential opportunities for the application of technology to reduce the friction between regions and borders through adoption of blockchain technology and leveraging the *Algorithmic Nation* assemblage further.

Regardless of the political challenges currently faced NI due to post-pandemic and post-Brexit factors, some workable solutions must be agreed for the city region to develop and rebuild trust across the Islands and within Europe, particularly, in light of current polls, which show further polarisation ideologically and 'strikingly low' trust in government and parties (Phinnemore et al. 2021). Further development of *Algorithmic Nationhood* leveraging opportunities created for new forms of ethical governance and engagement with the civic forums legislated in the NI context offers this opportunity.

There are already examples of experimentation in new digitisation of processes to support the implementation of trade post-Brexit and in response to the post-pandemic society, which are encouraging in this regard (Hervey et al. 2021; BBC 2021b).

Conclusion

This article has explored NI's current issues through the lens of an *Algorithmic Nation* assemblage, where many of the challenges it currently faces both post-pandemic and post-Brexit could be better addressed by engaging proactively in leveraging blockchain technology and smart cities frameworks across the key cities of the region towards upholding the principles and goodwill of the Belfast agreement (Calzada 2021d; Phinnemore and Hayward 2021; The Constitution Unit 2021). The opportunity to meet these challenges lies in the continuing growth and metropolitanisation of the population, in particular, in the city-regional context where Belfast and Derry/Londonderry as smart cities offer potential for integrating new logics and approaches towards governance and management through their infrastructure and ports, i.e. such as the case of Randox (Calzada 2018c). As suggested, the tension created through the perceived Irish Sea Border – produced by the NI protocol – could be reduced by integrating an *Algorithmic Nation's* approach to assist NI in meeting its twin challenges of supporting cross-border citizenship both within and between the UK and Ireland as well as the growing necessity to develop infrastructure to support citizens and their will to connect and contribute to sociopolitical discourse more generally (Whysall 2021). The reduction in trust around devolved governance now requires stakeholders from the UK, EU and RoI to support solutions to reduce post-Brexit tensions in the city-regionalised nation and investment in *Algorithmic Nationhood* approaches is evidently feasible through policy unfolding in areas such as health (Randox), economy (agrifood), energy and governance (ICC 2020). New technological approaches using blockchain to resolve challenges such as those exposed by the NI Protocol, such as extensive delays and costs caused in cross-bordering, could be further addressed as part of a new investment by stakeholders from the UK and EU and other stakeholders who seek to redress the challenges created in a post-pandemic NI. This would assist in reducing anxieties with over 50% of NI residents who believe that their views are not being heard and addressed by the UK, EU and Irish governments (Hayward and Phinnemore 2021). Indeed, engaging digitally in civic forums, democratic deliberative mechanisms and citizens' assemblies offers an interesting means to begin to engage in this important aspect of Strand 1 of the Belfast Agreement.

The challenges and dilemmas faced by NI are suited to finding solutions through framing as an *Algorithmic Nation*, where the devolved nature of this more liquid nation in its modern context and the requirement to appropriately and maturely engage in the right to decide principle as implemented within the Belfast Agreement show that new and more integrated approaches and logics to governance are found to support important dialogues around future evolution of sovereignty issues in NI.

The following set of dilemmas are summarised as the main findings of this article:

- (i) Post-Brexit dilemma: The post-Brexit situation and its complexities can be viewed as regressive or progressive for NI citizens dependent on the circumstance and viewpoint of NIP. Regardless, it provides an opportunity to engage in new governance logics to potentially involve a broader stakeholder base towards increasing stability and viability of proposed future arrangements.
- (ii) Sociopolitical dilemma: Increasing tensions around NIP countenanced by growing voice of ‘civic nationalists’ who, through their voting actions, offer a ‘third way’ to emerge in relation to bridging the challenges of traditionally ethnically nationalist positions towards a more integrated and mature debate.
- (iii) Algorithmic and Post-Pandemic dilemma: The *Algorithmic Nations*’ conceptual assemblage leveraging blockchain technology as supported in other geodemocratic areas offers a pathway to explore management of cross-bordering issues in this post-pandemic reality, by elevating digital citizens’ roles through increased critical awareness and empowering through platforms supporting a more productive, open and proactive digital activism.

As identified, opportunities include new e-democracy approaches to foster citizen engagement at the city-regional level and experimentation based on learnings from other city regions. These opportunities encompass the following: (i) Cities’ Coalition for Digital Rights encompassing 49 global smart cities and led by Barcelona, Amsterdam and New York City (Calzada, Pérez-Batlle, and Batlle-Montserrat 2021; Calzada 2021f); (ii) H2020-Replicate project consisting of 6 European smart cities coining the term ‘City-to-City-Learning Programme’ (Calzada 2020b); (iii) The Preston Model based on the Transition Towns paradigm and (iv) within the G20’s Smart Cities Alliance (including Barcelona and Medellin). These cities are delivering people-centred smart cities’ principles of ethical and less technocratic smart cities governance (Calzada 2021c, 2021f; May 2020). The development of digital ID such as in Estonia would offer better support to the important cross-bordering needs of citizens in NI, facilitating their participation in wider geopolitical developments across the jurisdictions in which they are aligned digitally (Usman 2019; Willems 2021; BBC 2021c).

The following are potential research avenues moving beyond this article’s positioning to further explore the *Algorithmic Nation* framework. First, in various contexts, contrasting city-regional conceptual assemblages and evaluating digital citizen and stakeholder engagement opportunities would be a useful insight. Second, exploring digital citizenship in city-regional contexts to measure the network effects of digital actors and agents in the areas of critical awareness and digital activism is encouraged to better understand the dynamics underpinning nation-state rescaling, particularly where citizen engagement is creating dialogue and empowering the process. Finally, action research engaging stakeholders in deploying experimental e-democracy platforms at city-regional levels through Penta Helix actors to explore innovation in this area offers possibility (Calzada 2020a).

Framing NI as an *Algorithmic Nation* conceptual assemblage and leveraging blockchain technology as a conduit to a more liquid citizenship offer great scope to address the requirements of this devolved city-regional nation in navigating the challenges and opportunities of cross-border and digital citizenship and a future right to decide through a future focused, inclusive and pragmatic democratic standpoint.

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