Main Article

Heterodox approaches to save the day: A framework for analysing data-related innovation in legacy media businesses

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Abstract
That legacy media organisations are struggling in this era of global platformisation and datafication is well established. Yet, the power of platforms as well as critiques of them could be seen as being framed and facilitated by the prevailing forms of neoclassical economics. This paper addresses how analysis and planning of data-driven innovation in legacy media organisations could benefit from the perspectives deriving from heterodox economics. Using approaches within heterodox economics as a foundation, we build on two novel conceptual frameworks – innovation commons and cross-innovation systems, where decentralisation of media markets and collaboration between agents on different levels are central. Further, three tools – open data, blockchains and agent-based modelling (ABM) – offer ways to operationalise these frameworks. Central to these tools are further democratisation and growing complexity, openness and dynamism that enable media organisations to identify paths towards data-driven innovation that could improve the competitiveness of the legacy media industry in the platform economy.

Keywords
agent-based modelling, blockchain technology, datafication, heterodox economics, media innovation, open data, platformisation

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Introduction

This paper discusses the potential of using heterodox economic approaches for interpreting data-related innovation activities in legacy media organisations. The paper is a theoretical exploration scrutinising whether heterodox approaches could help understand legacy media outlooks better. With 'legacy media' we refer to media institutions that emerged in the mass communication era – newspapers, magazines and broadcasting institutions with relative editorial autonomy delivering news and entertainment to wide audiences. Historically, in terms of business models, such media have acted as two-sided markets, as outlets for both advertisements and content. Nowadays, platform companies such as Facebook, Google, Amazon and so on collect and analyse data about their users more effectively than legacy media organisations and have achieved an advantage in targetted advertising. Legacy media companies, however, have historically had an additional role of servicing the public by providing news and other information for societal debates. Therefore, they have been seen as acting in the public interest in addition to being profitable. As Deuze (2005: 448–450) has pointed out, legacy media journalists often follow codes of conduct emphasising independence, autonomy, immediacy and a sense of ethics aiming for neutrality and objectivity. They also act as outlets for public debate (Caplan and Boyd, 2016: 8) and as the 'fourth estate' to check the powers of decision-makers (Felle, 2016). Legacy media providers are regulated by media laws while platform companies that also provide access to content have been avoiding this. As a result of fewer regulations and the data advantage, global platform companies are seen as putting local media out of business (Kleis Nielsen and Ganter, 2018).

Hence, the media industry could be argued to be succumbing to platform power (Evens and Donders, 2018). With this comes the need to enquire about what legacy media businesses could do in their operations to improve their position. Therefore, the central research question for this paper is: how can heterodox approaches to media economics contribute to improving our understanding of data analytics-related innovation in legacy media organisations?

Why heterodox economics? Firstly, because its subdomains evolutionary and institutional economics have most contributed to the study of innovation. Secondly, because there are limitations to neoclassical economics when it comes to addressing innovation in media and cultural markets. Thus, we start by addressing the shortcomings of neoclassical economics in view of legacy media's approaches to data analytics-led innovation. Next, we address how some of the principles of heterodox economic theories have been applied in relation to legacy media. Analysing legacy media operations through the lenses of heterodox economics is not that new, as demonstrated by Cunningham et al. (2015). However, this paper works towards a more practical focus on how to use data management and analytics in order to develop novel micro-economic approaches to media management.

Background: why legacy media innovation matters

Winter and Nelson (1982: 195) note that the dominance of neoclassical economics has conditioned a strong focus on micro-economic theorising, whereas firms are believed to operate only with given technologies that do not evolve. Therefore, the causes of long-term growth have been difficult to analyse. Winter and Nelson (1982: 196) summarise that

neoclassical economics focuses only on inputs, outputs and profits of firms. This limitation could be offset with Schumpeter's (1934) and Hicks's (1932) proposition that the notion of innovation could better account for thinking about economic growth (Winter and Nelson, 1982: 197). To put it bluntly, the static models of neoclassical micro-economics focussing mainly on input, output, prices and investments do not explain the complexity of innovation processes relevant for growth and development. The surrounding culture and norms also determine the opportunity space for innovation; therefore governments' and other institutions' activities (constituting 'national innovation systems', which could also include the wide populations of internet creators and users forming 'social network markets' – see Potts et al. (2008)) should be analysed additionally to micro-economic metrics.

It has been suggested that the dominance of classical and neoclassical economic approaches in the media markets in the past 150 years has led to a point where these markets are dominated by big platform companies (Rahman and Thelen, 2019: 178–179) characterised by their data collection and analytics capabilities, multi-sided markets, network effects and rent extraction (Sadowski, 2020) – largely leaving out the notion of creating public value. As pointed out by several scholars, platformisation may shape how societies at large function and conduct their everyday activities (Van Dijck et al., 2018; Zuboff, 2015). The impacts of platformisation are manifold, but central concerns are unequal power relations between platforms and users (Zuboff, 2015), democratic processes that are influenced by opaque algorithms (Caplan and Boyd, 2016) and consumer rights (Khan, 2016) when oligopolies dominate the provision of informational services.

It can be argued that many of these concerning developments have been conditioned by neoclassical rationales. Why so? Platform firms focus mainly on increasing their private profits. This fixation has taken shape since the 1970s and 80s to please shareholders who set efficiency and growth as central goals within firms. This led to punishing public firms for longer-term investments as shareholders expected short-term returns (Rahman and Thelen, 2019: 182). This changed the corporate landscape radically and platform firms follow some of the same goals.

The concept of the 'invisible hand' to organise the market has been relied upon in neoclassical theorising. With that, optimal pricing and fair competition are formed based on actors' rational choices. Seeing the platform firms dominate the global markets when it comes to online searches, e-commerce, social media, news, app stores and so on shows that the invisible hand of the market and the neoclassical approach behind it have not worked as has been the claim. The global platforms act as oligopolistic or near monopolistic forces on the information exchange market (Sadowski, 2020: 568–569), profiting privately from users' and companies' data while not providing clear accountability in return. This points to an unbalanced power relation between these firms and their users, which limits consumer choice. These implications therefore question the full applicability of notions such as the invisible hand, rational choice and the supremacy of private interest within the media industry.

Heterodox economics enters

Neoclassical rationale has therefore demonstrated a somewhat limited scope as it fails to take into account the public role that media plays and how it creates public value for the wider ecosystem. In addition, the tilted power relation stemming from large-scale data collection has resulted in a competitive edge for platform companies, at the expense of

legacy media. However, providing what are, in effect, public services – infrastructures for socialising and information distribution – should mean ideally that the benefits are shared more fairly. Why has that not happened? One explanation, offered by neo-Schumpeterians, is that the notion of value has changed over time. Hanusch and Pyka (2005: 1) summarise that while classical economists mostly discuss value creation in relation to the labour that goes into the production, for neoclassical economists, 'value' stands for the price determined by supply and demand. In relation to platform companies this could result in unproductive value extraction, which stands for manipulating existing assets – that is, the data created by users (Mazzucato, 2018: 7). Value creation for Mazzucato (2018: 7), however, would denote producing something genuinely new. Therefore, heterodox economics has a differing view on the notion of value. With these expansions on what value stands for, it is worth looking into how legacy media's operation could be reworked based on approaches other than neoclassical economics.

The role of a firm is viewed differently from an evolutionary economics perspective (Winter, 2006). As innovation is seen as the central driver of the economy (Perez, 2003), this means also looking more closely at the dynamics within a firm (Winter, 2006: 140). From the perspective of complexity economics, Holt et al. (2011) argue that the dynamics in an economy and from the perspective of a firm are not linear but complex and ever-changing, which therefore undermines the linear and fixed models used in neoclassical economics. Further, firms are not isolated from their environment; their activities are framed by policies, regulations (Perez, 2003: 42), cultural norms and history (Cunningham et al., 2015: 67). These views increase the complexity of an economic system and analysis of a firm's position in it. Evolutionary, complexity and institutional economics bring this to the forefront, which also justifies looking at legacy media through different lenses.

Why is this relevant now? Borrowing from Perez (2003), there are waves of technological revolutions where each new revolutionary technology defines the economic system for a period of time. For example, information and communications technology (ICT) innovations have been driving economic growth and social change since the 1960s. However, each wave has two periods: the first, where the new technology is being installed and the old technological system is exhausted; and a second 'golden age' where the positive influences reach all the sectors and citizens at large. There is a turning point in between where the old way of doing business is fighting hard to survive while the search for the golden age is happening in parallel. In Perez's (2016: 6) view, this is where the global digital economy is currently.

The turning point represents a moment to choose a way forward. The question is whether to continue with the existing system for media or to choose a different, more sustainable way to conduct business that remedies the inequalities caused in the previous economic phase. This is where heterodox economics could be useful.

New micro-level possibilities for legacy media organisations?

In this section we discuss potentially helpful tools, deriving from the various approaches that adhere to heterodox economics to analyse legacy media organisations. This undertaking can be viewed in two ways: first, the frameworks can lead to further academic

discussions concerning the mechanisms of innovation in legacy media companies; and second, when tested and further developed, these could become practical tools enabling legacy media companies to assess their innovation opportunities. It is important to note that these tools are presented based on their links to heterodox economic approaches. More specifically, they are based on viewing the functions of firms in more complex ways.

Innovation commons

Innovation commons is a concept suggested by Potts (2019). He argues that innovation starts with cooperation where scattered information is made meaningful and uncertainty is thus overcome. He uses Ostrom's work on commons where 'a commons is a communal property regime over a shared resource in which each stakeholder has an equal interest', which means sharing common resources for a common interest of a group (Potts, 2019: 8).

By 'commons' Potts (2019: 5) refers to groups of enthusiasts who face a shared problem to be overcome; he gives the examples of clubs (e.g. computer clubs) and movements (e.g. Paris cafés for the emergence of impressionism etc.). In relation to institutional economics, he emphasises the importance of creating institutions for commons in order to overcome uncertainty and diffuse information. What commons can achieve is better organisation and outcomes when the free-riding problem is resolved with appropriate institutional arrangements such that it becomes more beneficial to cooperate (Potts, 2019: 11).

Often, lack of innovation is seen as an investment problem. Potts (2019: 38), however, argues that the most important step is phase 0 where ideas are collected and assembled to overcome uncertainty about what information is needed. This points to the fact that it is networks and connections between different people that can help formulate where a common interest and thus a potential innovation opportunity are located. Moreover, it implies that the innovation problem is mainly a coordination problem, also suggested by Winter and Nelson (1982: 97).

This sketch of innovation commons can serve as an outline to analyse legacy media organisations. Regarding the capabilities to collect and use data (the coordination problem), legacy media organisations struggle with positioning themselves in the data-saturated world next to digital platforms, especially as they aim to create public value in addition to private value. This struggle can be viewed as a search for information to identify innovation opportunities. Relevant information, ways to approach and address data sources can be found both within media organisations as well as outside them. Hence, commons-like groupings can emerge at the boundaries of organisations or inside them. The latter approach is related to the idea of intrapreneurship.

Christensen's (1997) concept 'innovators dilemma' has motivated incumbents in multiple sectors to launch independent, entrepreneurial units within their organisations. This phenomenon, known as 'intrapreneurship', has also been observed among legacy media companies (Küng, 2015: 42). As Boyles (2016) observes, the internal start-up units in media organisations have been springing up and should bring with them a more adaptive spirit fit for a quickly changing digital news ecosystem. Nevertheless, she states that

there are tensions within the editorial and start-up-like divisions, displaying the potential difficulty in adapting to intrapreneurship (Boyles, 2016: 241). Boyles suggests that these differences in cultures could be overcome with rotations within the organisation where different roles are then performed and hierarchies broken. These tensions can be viewed, then, as a coordination problem discussed by Potts (2019).

Relatedly, Küng (2016: 114) introduces the concept of 'interpretative approach' to firms' strategizing, emphasising how employees with different epistemic backgrounds play a significant role within a media organisation. They link differently to the dynamically changing environment and bring in alternative ideas or data sources, enabling their combinations with yet other ones. This determines an organisational culture that is created and recreated continuously, but as a whole makes organisations more resilient. This is linked to what she calls the 'adaptive approach' where change is a central element determining rules and procedures within an organisation (Küng, 2016: 114). These approaches complement the innovation commons framework by linking it to specific media management strategies.

When facilitating commons-like groups consisting of different kinds of experts within organisations then Ostrom's (1990) criteria for assessing cooperation potential in a commons framework become relevant. Therein, the following eight criteria are relevant for our purposes (Potts, 2019: 116–127): boundaries, rules, consent, monitoring, sanctions, conflict resolution mechanisms, recognition of rights and nested enterprises. Each criterion should be clearly defined. For example, for successful functioning of the commons there should be rules, monitoring of rule-breaking and sanctions. The nature of these characteristics could be mapped to analyse legacy media organisations and their innovation processes. Organisational set-up can be analysed to determine whether adhering to the criteria above means a higher likelihood of successful cooperation. Retroactive enquiries into the dynamics of the innovation processes (new services or products) of legacy media companies could uncover the relevance of the framework and its applicability in relation to innovating content creation, services and internal processes across the media organisation. It could be used as a tool by media organisations to assess the potential of adopting a commons-like structure within or across their boundaries.

The questions to ask include whether there are diverse (including people approaching data sources and uses in different ways) self-emerging groups acting in common interest; whether partnerships with external stakeholders are initiated; what rules are put in place in order for the commons to not fail; and, lastly, whether these collaborations lead to successful innovations and market opportunities. This can bring about discoveries about collaboration and innovation trajectories that can serve as best practices for legacy media. García-Avilés (2012) demonstrated in a study focussing on The Guardian, BBC, RTVE and El Mundo that active internal communication between the working level and the management when making strategic decisions facilitated the emergence of innovations.

All this suggests that in the era of dynamic datafication there are practical ways to create links between collaborations among different epistemic communities and contribute to introducing new ideas and alternative interpretations within an organisation. It can make organisations more resilient, enabling them to come up with new, milieu-sensitive combinatory solutions for data uses.

Cross-innovations

In the previous section we focused on temporary efforts within media organisations to find solutions for specific development needs while combining people with different skills or expertise. Next, we introduce the phenomenon termed cross-innovation – when media organisations innovate by crossing sectoral boundaries. The concept was developed by Ibrus (2019b) and it builds on (national) innovation systems theory that itself grew out of evolutionary and institutional economics. But it also links these approaches with cultural and media studies, especially with concepts such as mediatisation, datafication and platformization. National innovation systems studies address the evolution of institutional systems that typically interlink firms, universities, investment banks, libraries, incubators, accelerators, public agencies and so on. The narrower version of innovation systems studies (Freeman, 1988; Nelson, 1993) has been focussing on knowledge and technology transfer between universities and firms as facilitating economic growth. The more holistic approach, driven by Lundvall and others (Lundvall, 1992; Potts, 2011), has been focussing on more tacit transfer of knowledge, on everyday dialogue and learning between firms and other institutions across existing value chains or beyond them.

The latter approach was used by Ibrus (2019b) to link innovation systems studies with media and creative industry studies. It was justified as innovations in media and creative industries are typically incremental; they are less driven by fundamental research or technology transfer and more so by tacit learning in human social networks. This results in incremental improvements in techniques, forms and meanings. That is, cultural innovations are constituted by dialogues and the resultant learning that happens in networks.

One of the central concepts for such theorisation is the 'rule' – suggested by Dopfer and Potts (2008). A rule is an idea that organises actions or resources into operations. Rules can be languages, discourses, conventions, religions, scientific discoveries, laws, norms, network protocols, technologies and so on. In neoclassical economics, there is virtually only one rule – the representative rationality of a single actor – and this is not supposed to change. In contrast, 'evolutionary micro-economics' recognises that there is a heterogeneity of actors with different rationalities and therefore there is also a multiplicity of rules that change. Evolutionary meso-economics considers the clusters of interrelated rules in terms of their carrier population – the 'industry', in our case legacy media industries. What matters, however, is that if innovations are understood as novel combinations of ideas or technological, social or cultural forms then such combinations as nascent rules are in the first place set to emerge at the boundaries of existing sectors. They emerge out of dialogues between industries and further develop when the parties in dialogue start auto-communicating (Hartley et al., 2021: 79–82) – they start distinguishing themselves and their unity by means of self-referential communications, defining and establishing the new rule and its social forms of being. This is what was meant by Ibrus (2019a) when they studied the 'emergence of cross-innovation systems': the emergence of new combinatory sub-sectors where legacy media is co-innovating with other service industries. A well-established example of such a phenomenon is the practice of transmedia story world development where output of (typically) audio-visual content is combined with the output of video games, comic-books, concerts and other events.

Development of such story worlds depends on the collaboration of different cultural industries.

Our proposition, however, is that one of the core areas of cross-innovation for legacy media is data exchange systems. Large platforms have been able to dominate extract value from data markets owing to the economies of scale and network effects they can exploit. They control contacts between customers and different kinds of service providers on the global scale. Yet, owing to their scale, their data collection methods are also standardised and they are not aware of all the local data resources outside of their platforms. This is the data that is collected by local authorities and various kinds of public and private enterprises. Relatedly, our suggestion is that while legacy media firms do not enjoy economies of scale in the global data markets, they could exploit economies of scope in local/national data ecosystems. By collaborating with public agencies (and their open data offerings) or other service sectors, legacy media firms could develop new kinds of data-based services – for example health content based on data from health industries; urban journalism based on aggregated mobility data; educational content services based on learning analytics provided by the educational sector; cultural recommendations based on, say, aggregated modelling based on ticketing and reception data; and so on. Development of such data sharing and/or open data ecosystems would constitute, in effect, locally relevant data-related innovation systems that would also be driven by a public value ethos – an understanding that sharing would bring about systemic growth and benefit all contributing parties.

Open data as an approach

As suggested above, open data sharing is one of the ways to coordinate the emergence of cross-innovation systems, relevant to legacy media. Open data or data produced or commissioned by public bodies or government-controlled entities that is made accessible can be freely used and redistributed by anyone. In a way it is one of the clearest forms of public value creation as governments make their data open so that others can derive value from it. Additionally, companies, especially public companies or broadcasters, can publish open data as a way to contribute to public value creation, so that others can create value from it.

In the academic literature there have been efforts to study open data-based innovation by private companies (Jetzek et al., 2014; Susha et al., 2015). Janssen et al. (2017) suggest that service innovation on the basis of open data tends to be limited and that businesses lack the knowledge on using open data for economic benefit. As Susha et al. (2015: 29) suggest, motivations for different firms are contingent on whether they are start-ups or more established firms. Start-ups, especially, often do not have the necessary skills to access and analyse open data (Susha et al., 2015: 29). For data journalism, Stoneman (2015: 1) echoes a similar concern, saying that data journalism needs specific skills. However, data journalism is one of the ways through which legacy media organisations can acquire new relevance – not only by analysing and publishing on governance practices and societal or market trends but also by using the emergent knowledge on those trends to innovate and adapt their own service provision. For instance, urban

population and mobility data is relevant for developing forms of location-based journalism; aggregated health data is needed for health journalism; and so on.

Related to public value, there seems to emerge an agreement that when businesses use open data, they should provide a service that benefits the public, not just the companies themselves (Conradie and Choenni, 2014). As Enders et al. (2021: 5) note, open data attracts different stakeholders, which can end in new collaborations and services. For legacy media, sharing data can mean increased collaboration and therefore play a significant role in innovation. More specifically, Enders et al. (2021) outline three categories of distinct benefit.

The first is internal improvements where a shift happens towards a collaborative mindset regarding sharing and using data; also, new data-related skills can emerge and data processes can become standardised. This, in legacy media organisations, could be likened to the once-only principle – that is, data that is collected once could be reused in a network of like-minded media organisations. This would reduce the administrative burden, but it requires unambiguous communication within the media organisations regarding data use. Additionally, regular brainstorming with the involvement of different stakeholders about existing datasets, for example archived cultural heritage data, could bring about new ideas for either new content and services or internal efficiencies. For instance, in Estonia work has started on using cultural heritage and media content archives to analyse public sphere evolution, providing journalists with tools for investigating the contexts behind current affairs in new ways (Ibrus and Kõnno, 2021).

The second is open data, which can be an innovation driver as media firms benefit from external skills, know-how and ideas as others engage with their published datasets. That is, building on Lundvall's (1992) idea of innovation systems evolving via tacit learning in networks, tinkering with peers on open data could lead to new services as more stakeholders get involved and discover possibilities previously unidentified. More practically, engaging with other companies or academia could bring about novel open data use cases and new collaborative formations (innovation commons or inter-institutional cross-innovation systems).

The third category is external visibility, which is improved as publishing data creates transparency among users and business partners and therefore increases the brand's reputation while also helping with community building between stakeholders (Enders et al., 2021). Therefore, open data does not fit the traditional way of measuring value in monetary terms and calls for a different, more multidimensional type of analysis.

In order to coordinate the emergence of public value-driven and commons-based innovation based on open data, Jetzek (2017) has suggested the development of open data platforms as multi-sided markets that bring together data providers and users, so that intermediation becomes the value that is created. This is related to Mazzucato's (2018) approach to public value creation where the public sector takes the early lead and coordinates an innovation system in order to let participants learn how value can emerge from it.

Concludingly, open data sharing by both public agencies and legacy media enterprises could become one of the main ways for coordinating the emergence of commons-based cross-innovation systems. These would be local and aimed at creating public value for

the society as well as use value for the media and cultural industries, strengthening potentially all actors in a cross-innovation system.

Blockchain solutions for the media industry

Public blockchains as open ledgers of data could be understood simply as another way to share open data. Yet, from the perspective of institutional economics (Allen et al., 2020), blockchains have been suggested to drive institutional change in the digital economies. As blockchains are also understood to drive decentralisation in the internet economy, they can be tied to the ideas of cross-innovation and innovation commons, where the processes require diverse expertise, shared purpose, permissionless participation, shared ownership and bottom-up enthusiasm. We argue that blockchains have at this point in time the potential to decentralise and democratise processes intrinsic to legacy media operations and can facilitate the emergence of a new institutional set-up.

Centralisation is how digital platforms handle data; they rarely share it with users or other businesses. Especially the question of rights has become fuzzy as these platforms often claim the published content and extract the value from it. Legacy media organisations could change this by using blockchains to assign credit in a transparent manner and with that offer payments for user and partner contributions. The ledger system provides security and also ensures transparency, similarly to the open data movement. Blockchain technologies allow the redefining of governance and coordination of relations within a network of actors by potentially reducing costs, increasing accountability and simplifying the exchange of value.

Differently from some of the other creative industries (film, music, art, social media), there has been less experimentation with blockchains in journalistic media (exceptions include Civil, AdChain, Nwzer and a few others – Ivancsics, 2019). However, innovations in these related sub-sectors are also relevant for journalism. Publicly available time stamping and ownership verification have been of most interest to creative industries, especially in terms of decentralising and automating the governance of authorship, provenance tracing and intellectual property rights (IPR) management. These could provide process innovation opportunities to legacy media as it typically collaborates with numerous authors and other contributors – easing IPR management and collaboration-related workflows. A marketplace for media content could be established. There, legacy media organisations in need of news gathering, photos, videos or infographics could buy the pieces and the rights. In doing so, they could increase cross-innovation as different legacy media companies would need different types of content that could then be more easily acquired. This could democratise the media market, exemplifying how blockchains could change the institutional set-up of the creative and media industries. The downside could be even more precarious work conditions for the creatives if they had to compete for such micro-contracts.

For many media companies, this technology is promising as contributions to a project, rights and licences could be more easily tracked, thus ensuring openness and transparency. It is also important that transactions between creators and users based on blockchain technology would eliminate the middleman – the dominant platform companies with multi-sided market infrastructures. Avoiding centralised platforms can

potentially increase collaboration and partnerships as more cross-sectoral collaboration could lead to new innovations. It again exemplifies how blockchains could act as game-changers in light of the institutional set-up of the media market. In terms of Dopfer and Potts's (2008) evolutionary meso-economics, blockchains could emerge as new rules that coordinate the emergence of novel cross-innovation systems.

Another decentralisation-related notion arises from the innovation commons framework: for innovation to occur it is presumed that a group faces a common problem that motivates them to collaborate and overcome the obstacle with a new approach (innovation) by pulling together their different expertise. This requires an institutional set-up with rules for the group ensuring progress and effective monitoring and eliminating free-riding. In legacy media, this becomes relevant when assigning credit for all kinds of contributors. Theoretically, blockchains allow creation of such rules for a group, mainly in the form of decentralised autonomous organisations (DAOs; see Hassan and De Filippi, 2021). The nature of a DAO can vary; it can mean automatically self-executing algorithms via smart contracts or a more informal commons initiative where internal rules, composition and sanctions are established by the members of the DAO (commons) and where the execution is less automated and allows for more dynamism. Thus, DAOs could be used as a new institutional form to facilitate participatory journalism as they enable the transparent sharing of rights and rewards as well as the handing over of governance media production to the wider community of contributors and stakeholders. However, designing DAOs needs care to ensure that they encourage creation of public value and focus on the common good. Any technology can carry differing values so advancing narrow private interests focused on profiteering by exploiting the creatives should be avoided. This risk has been highlighted by Schneider (2021), who states that less-economic and more-political forms of governance taking into account the common good should be the focus.

A final point that also fits into the innovation systems framework is that in order to create such institutional change, a supportive environment is needed. According to Allen et al. (2020), novel public policies are needed in order to facilitate blockchain-based institutional innovations. Having both innovative companies and a supportive innovation policy as a functioning network of mutually beneficial relations could produce a change that potentially challenges the centralised multi-sided markets approach. These systemic changes could be likened to what Mazzucato and Ryan-Collins (2022) label as market shaping, where the public sector focuses on changing the direction of innovation so that it encompasses more public value. This could change the notion of what competitiveness signifies. We propose that experimenting with blockchain technologies in order to build broader, more participatory media production and innovation systems could not only enable the cutting out of large platforms as non-productive rent-seekers in media markets but also increase accountability in the markets and in this way make value creation, including public value creation, more transparent and eventually more fairly remunerated.

Complexity economics and agent-based modelling

We have argued above that innovation is a complex process that is difficult to grasp with linear and fixed models of neoclassical economics. This applies also to contemporary

data-driven and collaborative innovation processes in media institutions. Hence, tools are needed to analyse and coordinate the ongoing processes. For this, some evolutionary economists (Winter and Nelson, 1982) have suggested agent-based modelling (ABM). ABM could serve as an analytical tool enabling media firms and researchers alike to discover the organisational dynamics around new products and services. The findings could help the firms assess and reshape their innovation processes, described above.

The main aim is to study general behaviour or aspects of a behaviour where both results and development paths can be explored (Elsner et al., 2014: 230). It involves several steps, from identifying the system – its components – to creating mathematical models where components are turned into variables and equations, formalising the model as a computer programme, determining which part of the system is to be investigated and how deeply it is to be studied, to finally running a simulation and analysing the results (Elsner et al., 2014: 230). A simulation is claimed to be valid when the data it produces is similar to the behaviour of the real-world structure; however, no simulation is completely correct or reliable (Elsner et al., 2014: 230). The main advantage of ABM is that it can uncover relevant aspects within the process of innovation by allowing study of a great variety of possible states and dynamics. It makes it easier to identify complex mechanisms and constraints in the system and these are calibrated using empirical data (Elsner et al., 2014: 230). These advantages make ABM an attractive tool as empirical data from different media organisations can make revealing real-life case studies. A researcher or a media company could map the components that form variables and equations, which are then formalised in a model to run a simulation in order to analyse the emerging patterns of cooperation, for example.

Further, ABM aims to meaningfully connect micro and macro levels. It aims to cover both and, by increasing complexity, introduces varied perspectives on potential innovation and competition strategies. It could help identify processes and agents that are crucial for innovation by mapping how ideas emerge, how new processes are implemented and how novel services and products are developed. Regarding the macro level, regulatory framework and media policy could be inserted as rules into the model to see how these impact the dynamic of a media organisation in a media system.

For analytic exercises, boundaries need to be drawn – the simpler the model, the easier the analysis. Hence, care needs to go into determining what composes a system. In the case of legacy media organisations, their employees, partners, relevant policymakers, rules stemming from regulations and such could be potentially accounted for in order to explore data-related innovation patterns and predict outcomes based on the decisions that agents take. It is possible to insert rules that guide how agents behave based on empirical input. The rules can be deduced from observing the organisational culture or from information from the surrounding agents (partners), or from laws and policies as rules. As a result, analysis via ABM can bring in more dynamism, heterogeneity and complexity as agents in those models can have varying resources, goals and views.

This relates to Holt et al.'s (2011: 358–60) suggestion to focus on the micro level and follow emerging dynamics based on empirical micro-level data that forms the basis for higher structures. This focus on dynamism in complexity economics matches with dynamic capabilities theory in the media management literature. Dynamic capabilities in the media management domain were originally defined by Teece et al. (1997: 517) as

'the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments'. In dynamic capabilities theory, similarly to complexity economics, the internal and the external are seen as overlapping. This further correlates with the notion of innovation commons as this, too, states that micro-level dynamics are important to follow for observing emerging patterns. Therefore, when identifying relevant agents – both internal resources and external conditions – via ABM, emerging innovation dynamics could be tracked to analyse commons-like groups within legacy media organisations, their external collaborative networks (cross-innovation systems) or even the DAOs they may initiate.

Already, ABM has been tested within media organisations mostly to simulate customer behaviour and marketing strategies. In other sectors, supply chain management has been analysed via ABM and ABM has been used together with network science to model the role of factors in innovation diffusion processes (Rand and Rust, 2011: 2). Therefore, we suggest, supply chain management and influential nodes in the innovation process network of legacy media organisations could be established via ABM.

Conclusion

This article departed from an understanding that neoclassical economics falls short in analysing innovation processes, including in the media industry, which operates on two levels – not just for private profit but also for creating public value. Additionally, linear and inflexible micro-economic modelling inherent to neoclassical theorising lacks the tools needed for analysing innovation processes that are complex and nuanced. In order to better analyse the opportunities for media organisations in the era of platformisation and datafication, we proposed turning to approaches within the heterodox economics domain.

We highlighted two concepts – 'innovation commons' and 'cross-innovation systems' – where the former stresses the importance of bottom-up initiatives and dialogue in tackling common issues via including different expertise, while the latter stresses institutional collaboration across sectoral boundaries to produce a more symbiotic relationship between partnering organisations. On a more operational level, we suggested that blockchains, open data and agent-based modelling present opportunities motivated by non-orthodox rationales but vary in terms of their focus. These three tools would allow legacy media organisations to view, assess and analyse their circumstances in new ways and with that potentially build their capacity to increase their competitiveness in an environment where the content and communications markets have been dominated by a few global players.

There is an overlap between the conceptual models and the operational tools. Openness, decentralisation, transparency, trust and dynamism characterise them all, while the overall purpose is that they are more likely to allow for public value creation to occur. While the conceptual models stress the importance of these characteristics in thinking about and planning innovation processes, the three tools are means to insert these values more concretely into analysing legacy media organisations and their potentials.

Open data movements stress the use of public data and sharing data. Their openness and transparency propositions mean that legacy media organisations that do not collect their own data could rely on public data to encourage data-driven innovation. Blockchain technology shares the openness and transparency objective, but provides a technological layer to create further trust, clarity in IPR and with that fairer payments. Additionally, the notion of DAOs means that decentralised set-ups of organisations as foreseen by innovation commons and cross-innovation theories can be employed while taking care that the public value principle is as relevant as the economic incentives driving the crypto-economics movement now. Further, ABM serves as an analytics tool enabling researchers and legacy media companies to assess complex innovation processes within and around legacy media organisations so that elements of data-driven innovation patterns can be identified more clearly and organisational change geared towards improved innovation processes can be more systematic. It adds to the dynamism needed to explore data-driven innovation efforts.

Regarding the implementation of these concepts and tools, there could be both enabling and limiting regulatory factors in different parts of the world. Cross innovations as a practice is typically encouraged by innovation policies, it has become a standard for governments to facilitate networking and collaboration between different sectors, including the creative industries. Yet, media enterprises, when sharing data with others, will need to stay compliant with EU's General Data Protection Regulation (GDPR) and other regional and national data protection regulations. Regarding provision of open data, both the EU and the US have policies that encourage open data provision. However, these activities are in the early stage, meaning that policies are not adapted to the needs of the media sector; published datasets are typically not very comprehensive and not enabling more complex analyses. Blockhains present the most contentious issue in the light of financial fraud. If rights or production information is registered in distributed ledgers this only needs recognition by relevant industry institutions, but if blockchains are used to issue tokens in order to use them in governance, it is expected that financial supervision authorities around the world will regulate this area more tightly, especially if specific tokens would qualify as securities. Yet, as this could limit the degrees of freedom for firms innovating with tokenization, many governments as well as the EU Commission are treading carefully, developing also infrastructures and supportive measures for such innovation, including by the media industries.

All together, our proposed five notions form a whole to think differently about the competitiveness of legacy media organisations regarding data-driven innovation for new services and products. Such innovation could outperform the rent-seeking logic inherent in the current media economy dominated by centralised platforms.

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