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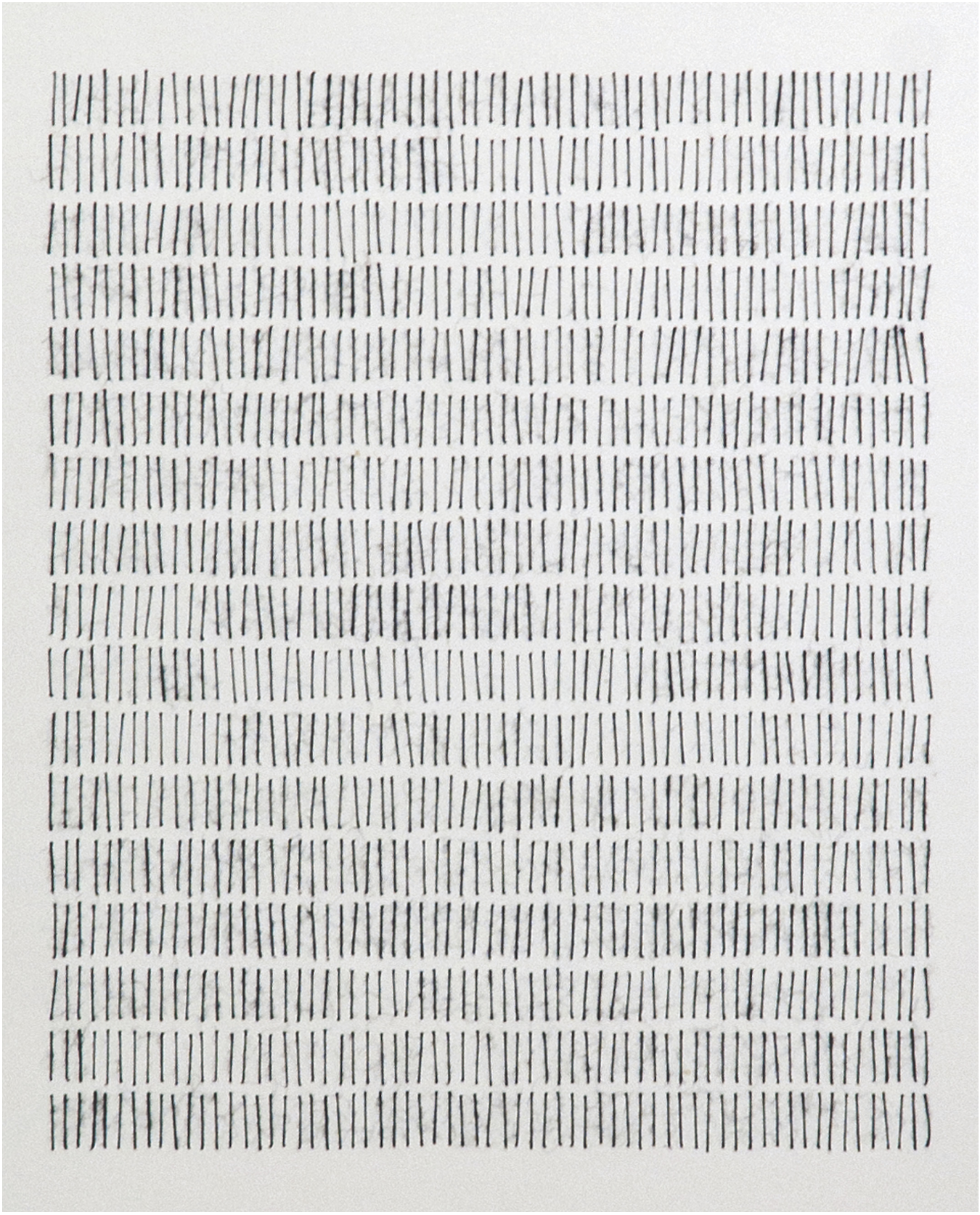

Excerpt from Needlework I: Simple Frameworks By Needle, by Setsuko Kurioka

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EDITORIAL

Counting the days

By Roger A. Søraa

This is perhaps (and hopefully) the most strangely situated editorial that will emerge from NJSTS. In Norway, it has, at the time of writing, been over two months since society closed down and we were commanded to work from home. As researchers, most of us are lucky, compared to most workers of society. Even though it might initially have been a strange few days at the home office, we made it through and found new ways of working. Throughout academia, however, most researchers are probably counting the days until society and our work situations return to a more normalized state.

The frontpage of this Issue depicts needlework art—"Sashiko" (刺し子)—by artist Setsuko Kurioka. Here, line after line after line represents something that lasts for a long time. Sashiko literally means "little stabs"—which quite neatly represents the new changes that we all have had to adjust to during these last months. Many have endured little stabs to our health, freedom, society, interactions, work, and daily practices. Only time will show what the full Shashiko will look like in the end. A complex weave on how we entered, lived with, and, hopefully, returned from these troubled times.

The Issue features two full length articles, with the first written by Niklas Hagen from University of Gothenburg. His article "Scaling up and rolling out through the Web – The 'platformization' of citizen science and scientific citizenship" investigates online public participation and engagement in science through crowdsourcing platforms with a case study of the Zooniverse platform, which hosts a large amount of citizen science projects.

The second article "'Best Before, Often Good After': Re-Scripting the Date Label of Food in Norway" by Tanja Plasil from NTNU, describes a controversy surrounding food-labels in Norway, showing how a seemingly simple addition to a label can reveal underlying issues and policies. As about one third of all food is thrown away, this article points to an important societal issue, of which Plasil gives a thorough account.

We also present a book review by Tor Anders Bye, of the 2018 book *The Platform Society* authored by José van Dijck, Thomas Poell, and Martijn de Waal. The book is about the role that new digital platforms play in public life and societal organization and how social practices and institutions are changed by this relationship. Bye's review discusses the book's main inquiry: "Who is or should be responsible and accountable for governing a fair and democratic platform society?" which is very timely indeed.

Finally, you can also read an Opinion Piece on "Plan S, Open Access and the potential roles for STS research" by Elena Šimukovič, which explores "Plan S," an initiative for open-access science publishing launched by a group of national research funding organisations in Europe, including the Research Council of Norway (Forskningsrådet). Šimukovič discusses the controversy surrounding Open Access, which Plan S showed to the research agenda. The opinion piece ponders what this means to researchers' identity as members of scientific communities and the role that publication records play in research assessment rituals for climbing the academic ladder. Being an Open Access academic journal, NJSTS follows this debate with keen interest.

As we progress into the new normal, we are glad to be able to bring you this new issue. While most things are delayed, we are actually seeing more submissions, peer-reviews, and academic discussions. Perhaps scholars have more time to finish up work, now that meetings are moved online, or are researchers more pensive these days?

With this, I wish you an insightful reading of the issue and hope that we can see each other in person soon. In the meantime, let's try, as Muhammad Ali said, to "not count the days, but make the days count."

Dr. Roger A. Søraa
Editor in Chief

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SCALING UP AND ROLLING OUT THROUGH THE WEB:

The "platformization" of citizen science and scientific citizenship

by Niclas Hagen

The purpose of this paper is to investigate online public participation and engagement in science through crowdsourcing platforms. In order to fulfil this purpose, this paper will use the crowdsourcing platform Zooniverse as a case study, as it constitutes the most prominent and established citizen science platform today. The point of departure for the analysis is that Zooniverse can be seen as a "platformization" of citizen science and scientific citizenship. The paper suggests that the mobilisation of individuals who participate and engage in science on the Zooniverse platform takes place through an epistemic culture that emphasises both authenticity and prospects of novel discoveries. Yet, in the process of turning "raw" data into useable data, Zooniverse has implemented a framework that structures the crowd, something that limits the sort of participation that is offered on the platform. This limitation means that the platform as a whole hardly be seen as fostering a more radical democratic inclusion, for example in the form of a co-production of scientific knowledge, that dissolves the institutional borders between scientists and non-professional volunteers.

Keywords: Citizen science, zooniverse, participation, platforms, epistemic culture, power

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Introduction

The developed world is increasingly becoming the world of direct public participation through social media, even to such degree that some observers are characterising the present economic system in terms of "platform capitalism". This terminology indicates a broader transformation, from a more conventional setting where individual firms compete for customers to a seemingly flatter and more participatory setting in which customers engage directly with each other, mediated through various web-based applications (Morozov, 2015). In an article in *The Guardian*, journalist Evgeny Morozov (2015) noted that with a smartphone "in their pockets, individuals can suddenly do things that previously required an array of institutions" (Morozov, 2015). In the early days of the Web, engagement between various actors took place through bulletin boards, Usenet discussions, home pages, chat rooms and blogs, but these venues have to a large degree been superseded by large-scale social media such as Facebook, Twitter, YouTube, Instagram, Flickr and Tumblr (Clarke et al., 2014, p. 1447). Concurrent with this development, experts on software studies have stressed the growing importance of software as an assembly that structures our social and everyday lives (Berry, 2015; van Dijck, 2013, p. 29).

This development can now also be observed within science, in the form of new and powerful ways to enrol and engage volunteers to participate in various citizen science projects through crowdsourcing platforms. Findings by Kullenberg and Kasperowski (2016) show that citizen science projects that are organised through digital platforms mark both qualitative and quantitative organisational change which citizens can be involved in new instances of the scientific process, and in much larger numbers due to the logistical affordances of digital platforms p. 13. The most prominent example of this development is Zooniverse (https://www.zooniverse.org), which currently hosts over one hundred (102) citizen science projects on its website (https://www.zooniverse.org/projects). These are projects that not only enrol but also rely on volunteers to take a direct part in scientific work, performing mainly classificatory tasks in different varieties. The classifications made by the volunteers are then aggregated, through algorithms, into scientific data used by researchers in their different projects. Moreover, Zooniverse not only distributes scientific tasks to volunteers but it also distributes the capacity to set up and launch projects to anyone who would like to enrol volunteers as part of their project design. The website offers an online citizen science project-building tool through which any individual or group of individuals can design, build and then, after a review and test process by the Zooniverse team and volunteers, launch projects that are part of the Zooniverse group of projects (https://www.zooniverse.org/lab/).

As a crowdsourcing platform that distributes scientific tasks to volunteers, as well as distributes the capacity to set up and launch projects, Zooniverse shares similarities with other crowdsourcing platforms, such as Amazon Mechanical Turk (MTurk). However, there are some significant differences between Zooniverse and MTurk that separates these two platforms. Firstly, whereas the MTurk is based on a commercial model (the participants are finacialy rewarded for completing assignments), Zooniverse relies on a non-commercial model, where participants take part in scientific work on a voluntary basis. Moreover, as pointed out by Graham and Greenhill (2016), differences between the MTurk and Zooniverse can also be seen in relation to the sort of engagement offered to the participants on each platform. In contrast to the MTurk platform, Zooniverse offers an engagement that moves beyond the immediate task at hand. Participants in the Zooniverse projects can, for example, be part of an epistemic culture or even in some cases to exercise resistance in relation to the classificatory assignments or tasks at hand in different projects (Kasperowski & Hillman, 2018; Graham & Greenhill, 2016). Moreover, as stated by Woodcock et al. (2017), in addition to the micro-work tasks offered on the MTurk, the work performed on the Zooniverse platform also harbours the chance of making serendipitous discoveries that, at least in theory but maybe not in practice, brings forward the possibility to contribute with something beyond the task at hand. On the basis of these differences, this paper will concentrate its analysis on the Zooniverse as this crowdsourcing platform provides a more comprehensive framework with regards to the "platformization" of public understanding and engagement in science than the MTurk platform.

Within STS, public participation and engagement in science have often been investigated and debated through the concept of citizen science and scientific citizenship, where public participation and engagement have been viewed in terms of deliberative measures and initiatives in relation to democratisation of science and science policy (see for example Irwin, 1995). Still, in order to fully understand the various implications of how crowdsourcing platforms such as Zooniverse mobilise public participation and engagement in science, further research is needed. Consequently, the purpose of this paper is to investigate online public participation and engagement in science through crowdsourcing platforms. Moreover, the paper intends to answer the following research questions: How are public participation and engagement in science mobilised on Zooniverse? How is scientific data and scientific knowledge produced on Zooniverse? And how can we relate the mobilisation and production of scientific knowledge to established understandings of citizen science and scientific citizenship within STS?

The disposition of the paper is as follows: The next section will discuss the analytical framework used in this paper. Thereafter, follows a discussion on previous research performed on citizen

science, as well as on digital platforms. The section that presents previous research will be followed by a section that will discuss how Zooniverse implements Citizen Science through a crowdsourcing framework. Finally, the paper concludes with a discussion that relates the findings in the previous section to notions within STS on citizen science and scientific citizenship.

Analytical framework: Digital platforms and "platformization"

The transformation of Web 1.0 to Web 2.0 yields a dichotomous difference between the conceptions of Web 1.0 as 'Web-information-source' and Web 2.0 as 'Web-as-participation-source' (McKelvey, 2011, p. 234; Song, 2010, p. 151; van Dijck & Nieborg, 2009). Within the academic context, the notion of platform has gained increased importance as *an analytical concept* as it captures various features that lie at the heart of the transformation of Web 1.0 to Web 2.0, as well as the ubiquitous societal presence of social media in the developed world. Platforms are usually hardware, software or services (or combinations thereof) that help structure or code social activities into formatted protocols and present these processes through user-friendly interfaces (van Dijck, 2012, p. 142). Platforms, as noted by van Dijck, are 'providers of software, (sometimes) hardware and services that help code social activities into a computational architecture' (van Dijck, 2013, p. 29). Digital platforms have an intrinsic ability to trigger and steer users' creative or communicative contributions, while users, through their interaction with the digital architecture of platforms, may in turn influence the flow of communication and information activated by a platform. José van Dijck and Thomas Poell (2013) links this dual ability as part of digital platforms' intrinsic ability to connect and mediate users' activities and to define how connections are taking shape, even though users themselves, can exert considerable influence over the contribution of content (p. 8). Scholars, who work in the area of media studies, analytically discuss this dual ability through the term "platformization" (Helmond, 2015), which Bratton (2015) describes as 'platforms provide an armature and induce processes to conform to it' (p. 42). Web-based platforms then contain a simultaneous movement that on the one hand distributes or de-centralises forms of autonomy to its users while, on the other hand, also standardises or re-centralises the conditions of communication and interaction among its users, thereby drawing many actors into a common architecture (Bratton, 2015; Helmond, 2015; Galloway, 2004). In conjunction to the current rapid growth of various digital platforms, resulting in an ecosystem (see below) of digital platforms, other scholars refers to "platformization" as the transformation of entire societal sectors, a transformation that infers the ability to reshape and reorganise society through the exercise of power (van Dijck, Poell & de Waal, 2018; Gillespie 2010 & 2015).

Closely linked to this de-centralising feature of platforms is the significance of protocols in order to coordinate and structure communications and actions. As noted by Galloway (2004), a protocol is a 'technique for achieving voluntary regulation within a contingent environment', which 'establishes the essential points necessary to enact an agreed-upon standard of action' (p. 7). An important aspect of the standardisation induced by platforms consists of various forms of protocols (van Dijck, 2013, p. 31). Another important feature concerns platforms' ability to perform large-scale quantifications. The novel and specific quantifying feature that is intrinsic to platforms such as Facebook and Twitter are their ability to produce automatically derived meta-data (such as time stamps and GPS-inferred locations) from smart phones (van Dijck & Poell, 2013, p. 9). When it comes to this ability to perform large-scale quantifications, each type of content that is handled on the platform can be treated in terms of data; with regard to social media platforms such as Facebook or Twitter, even relationships (friends, likes, trends) are quantified and represented as data (van Dijck & Poell, 2013, p. 9). In relation to the features that have been discussed above, the notion of popularity becomes crucial. Within the realm of social media and social media platforms, popularity revolves around pursuing online attention and getting users to regularly come back to the platform. As noted by, for example, Terranova (2012), the notion of attention has been mobilised as an economic category within the overall discourse on what has been called "the new economy" or the digital economy". Each platform has its distinct mechanisms in order to get and retain users' attention; nevertheless, van Dijck and Poell (2013) believe that these mechanisms simultaneously de-centralise (for example, by letting users generate users' platform content) and re-centralise (for example, by utilising algorithms that measure, rank and promote certain user generated content on the platform) control and influence over the content on a social media platform (pp. 6–7).

In addition to the features discussed above, the rapid growth of digital platforms during the latest decade has also resulted in an evolving ecosystem of various types of platforms, where van Dijck, Poell & de Waal (2018) makes a distinction between two main types of platforms (p. 12). The first type, the infrastructural platforms, are arguably the most influential type of platforms, many of them owned and operated by such influential high-tech companies as Alphabet-Google, Apple, Facebook, Amazon, and Microsoft. These infrastructural platforms form the core of the platform ecosystem, upon which other platforms and apps can be built or in other ways connected to as these infrastructural platforms also serves as gatekeepers through which data are managed, processed and stored. These types of platforms are for example search engines, browsers, servers and cloud computing, as well as social networking, app stores, geospatial and navigation services (van Dijck, Poell & de Waal, 2018 pp. 12–13). The second type

of platforms are sectorial platforms, which are directed and offer digital services towards particular sector or niche, such as news, transportation, education, health, hospitality. Often, these sectorial platforms are dependent and even built upon core features offered by the infrastructural platforms that gives these infrastructural platforms, and the companies that owns and runs these platforms, a considerable amount of power since they are in a unique position to connect, combine and even direct data streams, information, and intelligence within this evolving ecosystem of platforms (Plantin & Punathambekar, 2018; van Dijck, Poell & de Waal, 2018, pp. 16–17). Nevertheless, scholars investigating digital platforms and their effects, points upon the dynamic nature of the relationships between infrastructural and sectorial platforms, where sectorial platforms such as Facebook through time can evolve into a dominating infrastructural platform (Plantin & Punathambekar, 2018, pp. 169–170). Moreover, this flexible and dynamic character of the platform ecosystem, leads van Dijck, Poell & de Waal (2018) to argue for an analytical focus on 'how platforms work in specific contexts' rather than solely focusing on fixating specific platforms as either infrastructural or sectorial platforms (p. 19).

Previous research

This section will begin with an overview of previous research on citizen science, followed by an overview of previous research that has used the platform concept as its main analytical concept. This overview will encompass research performed in Internet and media studies.

Citizen science and scientific citizenship

The concept of citizen science has recently gained unprecedented visibility in academic literature (Kullenberg & Kasperowski, 2016; Follett & Strezov, 2015) and has also frequently been the subject of various science policy initiatives (see for example Nascimento et al., 2014; Pocock et al., 2014). Nevertheless, as noted by Kasperowski and Bronéus (2016), the concept has an ambiguous meaning, where they identify two main notions, which were both conceived of in the mid-nineteen nineties, long before such developments as Web 2.0. and Zooniverse. The first refers to representative notion of citizen science that often has taken the form of deliberative initiatives, which have been implemented in the form of negotiations between various stakeholders affected by scientific knowledge, informing policy decisions (Kasperowski & Brounéus, 2016; Hagendijk & Irwin, 2006; Irwin, 1995 & 2001). The relation between citizen science and scientific citizenship can be seen in terms of deliberation, dialogue and negotiations, where the goal of citizen science is to bridge the gap between the public and science that will lead to a more active scientific citizenship among the public. This is characterised by dialogue and deliberative decision-making between the public and science, in relation to risk and environmental threat (Bonney et al., 2016; Irwin, 1995). Another important aspect in relation to the representative notion of citizen science and scientific citizenship concerns the relationship between experts and lay people. Here, influential discussions within STS point to the epistemic differences between lay people and experts. Viewpoints that proscribe that these epistemic differences between lay knowledge and expertise should be accounted for and included in policy processes have been influential, advocating for the inclusion of ordinary citizens in scientific policy processes (e.g., Irwin 1995 & 2001; Wynne, 1992 & 1996). The notions of citizen science and scientific citizenship contain aspects of power, where the deliberative features of citizen science and scientific citizenship are seen as a way to resolve an unequal distribution of power between the public and science.

The second conceptualisation concerns initiatives of a more local nature that often revolve around health or environmental issues such as pollution or draining of natural resources. In this more local context, citizen science becomes a strategy for citizens who are affected by these environmental issues in various ways, to influence political decision-making or legal processes. Thus, the primary objective in this second conceptualisation of citizen science is not to achieve scientific output, even though these local initiatives still rely on scientific standards – and in many cases scientific laboratories or instruments, for creating valid data (Kasperowski & Brounéus, 2016). Rather, this form of citizen science can be seen, as noted by Kullenberg (2015), as a form of resistance on behalf of citizens that can be very successful as long as it is able to produce valid scientific facts through established methods (p. 50). The funding is often structured through NGOs or crowdfunding campaigns and occasionally through traditional scientific funding. The participating citizens take an active role in defining the problem at hand as well as in the collection and analysis of the data (Ottinger, 2010; Orta-Martínez & Finer, 2010).

Platforms in Internet and digital media studies

Within Internet and digital media studies, the notion of platform has been used more extensively than in STS, often in conjunction with the development from Web 1.0 to 2.0. Here, the concept has evolved into an emerging sub-discipline (platform studies) to media and Internet studies, which originated from investigations and discussions on various material, including social and cultural dimensions of computer games (see, for example, Bogost & Monfort, 2009; Monfort & Bogost, 2009). One important assignment for scholars working within platform studies has been to establish the platform notion as a viable analytical concept. The main analytical advantage of the concept resides in how it enables us to understand how various computer related phenomena constitutes integration of various levels, an integration that not only involves studying the social and cultural dimensions at

hand, but also how these dimensions, on a deep structural level, is constituted through computer code (Berry, 2015, pp. 20–21; McKelvey, 2011). All these levels are joined and aligned upon platforms, which exert its social, political and cultural effects through this alignment.

However, in conjunction with the development from Web 1.0 to 2.0, the platform concept has attained expanded use among scholars that often critically investigate various aspects of social media, especially such digital media intermediaries as YouTube, Twitter and Facebook. Research that make use of the platform concept as part of investigations of social media, include Gillespie (2010) who discusses how such digital intermediaries such as YouTube use the concept in contemporary society, suggesting that that the main discursive work achieved by using the concept consists of its ability to bring various discourses 'into alignment without them unsettling each other' (Gillespie, 2010, p. 353). Moreover, this ability to align various levels includes such effects as a political ability to shape the social dynamics and interactions that take place upon platforms crafted by the logic of its algorithms, computer codes, business models and the implementation of its community guidelines (Gillespie, 2015, p. 2; Langlois et al., 2009). Others that have studied how digital platforms such as Facebook and Twitter shape the social dynamics and interactions that take place upon these digital platforms include Thomas (2013), Hands (2013), Gerlitz and Helmond (2013), as well as van Dijck (2013). In addition to the above research that focuses upon large-scale social media platforms, Goriunova (2012) utilises the platform notion as her main analytical concept in her investigation of art and cultural production on the Internet.

Furthermore, Plantin (2015) has studied the relation between online public participation, platforms and novel possibilities for the public to extract, monitor and aggregate environmental data. The focus of Plantin's (2015) investigation is the mapping practices that could be seen among concerned citizen after the Fukushima Daiichi disaster in Japan, which gave rise to participative practices that revolved around extracting, monitoring and mapping environmental data upon radiation. Many of these participative practices took place on the Google Map platform, utilising the possibility to create and run applications on Google MAP (through the Google Map API) in order to create radiation maps that showed the level and spread of radiation after the disaster in 2011 (pp. 904, 906). In addition to this study, Plantin and Punathambekar (2018) has also been discussed platforms as an evolving critical and increasingly dominating and powerful societal infrastructure. This line of inquiry is also made by van Dijck, Poell & de Waal (2018), who investigates and discuss the transformation of entire societal sectors due to digital platforms and their growing social, cultural and political influence.

However, none of the previous research have investigated how online public participation and engagement in science is realised through such platforms as Zooniverse. The paper intends to leave a contribution to both the field of STS and the field of Internet and media studies by addressing this gap.

Zooniverse: Citizen science through a crowdsourcing platform

This section will address the question of how public participation and engagement in science is mobilised on Zooniverse? The point of departure for answering this question is that Zooniverse constitutes a digital platform that mobilises the public into a crowdsourcing framework. The origins of this crowdsourcing framework are to be found in the Galaxy Zoo project, from which the major objectives of the Zooniverse platform were developed.

From Galaxy Zoo to Zooniverse

Zooniverse originates from one of the projects that is featured on the platform, the Galaxy Zoo project (http://www.galaxyzoo.org/?_ga=1.202457361.1403256780.1435054658) that was launched in 2007 as a solution to the data-deluge problem within astronomy. This data-deluge problem came about since the Sloan Digital Sky Survey produced such a large amount of data, astronomical morphological images of galaxies, which made an analysis of the entire data-set by professional astronomers an impossibility with regard to the time required to go through the entire data-set, especially as each astronomical image required multiple independently made classifications in order to reach confidence (Meyer & Schroeder, 2015, pp. 82–83; Marshall, Lintott, & Fletcher, 2015, pp. 256–257). The idea for enrolling volunteers for classification of galaxies was inspired by another citizen science project, the Stardust@home project (in which volunteers were asked to scan through astronomical images in order to identify dust grains in the images that originate from outside our Solar System), which was conducted by the University of Berkeley (Marshall, Lintott, & Fletcher, 2015, pp. 256–257; Stardust@home). Before the Galaxy Zoo web site was launched, professional astronomers had classified parts of the Sloan Digital Sky Survey, and this professional categorisation provided a baseline against which the classifications made by volunteers could be measured (Meyer & Schroeder, 2015, pp. 82–83). To date, the rate of participation in the Galaxy Zoo project amounts to several hundred thousand people, and the Galaxy Zoo project was later joined by other citizen science projects that were developed and hosted on the Zooniverse platform, which hosts projects from such diverse fields such as ecology to papyrology (Marshall, Lintott, & Fletcher, 2015, p. 261). Currently, the platform host over 100 citizen science projects, ranging from projects within the natural sciences, humanities, and medicine (https://www.zooniverse.org/projects). Moreover, the platform involves nearly two million users worldwide, and the projects hosted on the platform have altogether resulted in 160 peer-reviewed publications (https://www.zooniverse.org/about/highlights).

The origins of Zooniverse lies then in the Galaxy Zoo project, and the crowdsourcing solution developed within this project as a way to handle data-sets too big for researchers to classify on their own. This is a set up that still characterises how the platformed operates today:

> With the help of Zooniverse volunteers, researchers can analyse their information more quickly and accurately than would otherwise be possible, saving time and resources, advancing the ability of computers to do the same tasks, and leading to faster progress and understanding of the world, getting to exciting results more quickly (https://www.zooniverse.org/about).

Consequently, the platform has two major objectives, the first of which is to provide an online tool through which (mainly) professional researchers can turn "raw" data into usable data by the help of a large crowd of users that performs relatively simple classifying tasks. The other objective is a broader ambition to engage in scientific education and outreach activities of various sorts through the projects and the platform's crowdsourcing framework (Woodcock et. al., 2017). The essential aspect of realising these two objectives are the twin movements of de-centralisation and re-centralisation, and these two movements will be investigated in more detail below in relation to building and managing a crowd of volunteers and turning "raw data" into usable data. These two features are fundamental in order to conduct citizen science through a crowdsourced framework.

Mobilising a crowd of volunteers

The first aspect of de-centralising parts of the research process involves the unique human abilities that forms the basis of the various forms of classifications performed by the volunteers on the Zooniverse platform. One of the main limitations of an automated process wherein the empirical material in need of classifications would be classified through an automated process (for example by an AI) resides in the (still) unique human capability to spot various forms of anomalies that cannot be discovered by, for example, an AI or an algorithm (Kasperowski & Hagen, 2019, p. 172):

> The major challenge of 21st century research is dealing with the flood of information we can now collect about the world around us. Computers can help, but in many fields the human ability for pattern recognition — and our ability to be surprised — makes us superior (https://www.zooniverse.org/about).

The essential point of departure that enables the de-centralisation parts of the research process to volunteers is then the unique abilities of human perception and pattern recognition, which gives humans the unique capability for both "mundane" classificatory work but also for spotting anomalies that might harbour the seeds for novel scientific discoveries. One example of the latter is the astronomical phenomena (that goes under the name Hanny's Voorwerp) discovered by the Dutch schoolteacher Hanny van Arkel, while she participated in the Zooniverse project Galaxy Zoo. Hanny van Arkel spotted an anomaly in the images meant for classification and the phenomena, which is still not fully explained, resulted in a scientific paper in which van Arkel was one of the co-authors (Kasperowski and Hagen, 2019, pp. 175–176; https://www.hannysvoorwerp.com/3-voorwerp-in-the-pictures/). These kinds of discoveries, made by a single individual with a resulting co-authorship on a scientific paper, are of course an exception, but it nevertheless constitutes a harbouring possibility rhetorically used by the platform to attract, mobilise and retain volunteers (see below).

So, the basis for de-centralising parts of the research process to non-scientists resides in perceptive abilities among humans, an ability that opens up for mobilising volunteers into handling large data-sets in the form of unclassified images through a crowdsourcing framework. Still, in order to take advantage of this unique ability, volunteers need to be attracted, mobilised but also to "encouraged" to actually do the classification tasks that are at the heart of Zooniverse's objectives. As a digital platform, Zooniverse is part of what Terranova (2012) has termed "The Attention Economy", in which attention can become not simply a commodity like others, but a kind of capital assess. In order then to de-centralise parts of the research process, Zooniverse needs to make itself relevant, as well as attract the attention of the crowd in the vast competition between websites on the Web. In order to attract the attention of volunteers, Zooniverse reaches out to the crowd by invoking both authenticity and the possibility for significant discoveries like the one made by Hanny van Arkel, but also that the contributions made by every volunteer increases our understanding of our world:

> You'll be able to study authentic objects of interest gathered by researchers, like images of faraway galaxies, historical records and diaries, or videos of animals in their natural habitats. By answering simple questions about them, you'll help contribute to our understanding of our world, our history, our Universe, and more [...] Zooniverse projects are constructed with the aim of converting volunteers' efforts into measurable results. These projects have produced a large number of published research papers, as well as several open-source sets of analyzed data. In some cases, Zooniverse volunteers have even made completely unexpected and scientifically significant discoveries (https://www.zooniverse.org/about).

The prospect of an active involvement in the scientific process, of actually doing "real" scientific work is also an aspect that are pointed upon in previous research on what motivates volunteers to participate in online citizen science. For example, Jennet et. al. (2016) found that volunteers initially are motivated by curiosity, interest in science, and a desire to contribute to research (p. 7).

To keep the attention of the crowd, the platform has a low threshold that enables anyone to immediately contribute the progress of

science, regardless of previous skills or formal education. Moreover, the individual volunteers who is attracted to the platform has also a wide range of projects to choose from, all developed and operated with the same incentives of inclusiveness and a low-threshold that welcomes anyone to take part in the production of scientific knowledge:

> You don't need any specialised background, training, or expertise to participate in any Zooniverse projects. We make it easy for anyone to contribute to real academic research, on their own computer, at their own convenience [...] With our wide-ranging and ever-expanding suite of projects, covering many disciplines and topics across the sciences and humanities, there's a place for anyone and everyone to explore, learn and have fun in the Zooniverse. To volunteer with us, just go to the Projects page, choose one you like the look of, and get started (https://www.zooniverse.org/about).

Following Kasperowski and Hillman (2018) the incentives used by Zooniverse to gain and retain the attention of the crowd can be seen as a way to mobilise the crowd into an epistemic culture. This epistemic culture revolves around the values of authenticity, volunteering on Zooniverse means that you take part in solving authentic scientific problems, but also around inclusiveness where everyone can take part in the endeavour to expand scientific knowledge through the micro-tasks performed by the volunteers. Moreover, this epistemic culture also contains a value of equality, where the outsider can be on par with the scientists both in the form of a collective and as an individual depending on the nature of discovery. Here, Hanny van Arkel's discovery of "Hanny's Voorwerp" constitutes a possibility for the anyone in the large crowd of volunteers of individual discovery, to see something that no one has seen before (Kasperowski & Hillman, 2018, p. 584). Another strategy for mobilising individuals into the epistemic culture of Zooniverse consists of providing discussion boards, both in connection to each individual citizen science project on the platform, but also a discussion board connected to whole Zooniverse platform:

> A significant amount of this research takes place on the Zooniverse discussion boards, where volunteers can work together with each other and with the research teams. These boards are integrated with each project to allow for everything from quick hashtagging to in-depth collaborative analysis. There is also a central Zooniverse board for general chat and discussion about Zooniverse-wide matters. (https://www.zooniverse.org/about).

Yet, realising this incentive of an authentic participation in the scientific process is of course connected to, but also subordinated the objective of turning "raw" data into useable data. This is a process that is highly structured and also dependent on algorithms that organises the crowd of volunteers into a collective, thereby dissolving the individual classifier into a collective.

Turning "raw" data into useable data

As already mentioned in the previous section, one of the main objectives for Zooniverse are to provide an online tool through which (mainly) professional researchers can turn "raw" data into usable data. In contrast to the mobilisation of a large crowd of volunteers, which is based on a de-centralisation of parts of the research process, the process of turning "raw" data into useable data is based on the other side of the twin movements of "platformization; re-centralisation. To ensure data quality, the platform relies on protocols that guides the classificatory work performed in each project hosted on the platform (Kasperowski & Hagen, 2019, p. 177). Naturally, these protocols are developed and implemented in relation to the nature of the empirical material in need of classification in each project (pictures of galaxies, transcription of documents etc.), but nevertheless the epistemological basis for all projects consists of standardised protocols, that the crowd are expected to follow in order to ensure that "raw" data is turned into useable data for the researchers. Moreover, the usage of guiding protocols is combined with another form re-centralisation in which each individual classification made by the volunteers is combined into an aggregated classification (Hines, Kosmala, Swanson & Lintott, 2015, p. 3975). Since volunteers can make mistakes, each item (images, letters in a document that are to be transcribed etc.) is shown to and classified by multiple individuals, and a critical step for achieving good data quality is to combine these classifications into one aggregated classification, something that is done through so called aggregation algorithms:

> Our projects combine contributions from many individual volunteers, relying on a version of the 'wisdom of crowds' to produce reliable and accurate data. By having many people look at the data we often can also estimate how likely we are to make an error (https://www.zooniverse.org/about).

As argued by Gillespie (2014), algorithms are more than tools. They are also stabilisers of trust, practical and symbolic assurances that their evaluations and output are both fair and accurate, free from subjectivity, error or attempted influence (p. 179). This argument is very much valid in relation to the re-centralisation of classification through the aggregation algorithms used by Zooniverse. From a research point of view, the legitimacy of Zooniverse rests on its ability to produce high-quality data; that is, the classifications made on the platform has to be correct and accurate in order to generate trust among the researchers who use the platform for classifying large data-sets. Here, the combination of individual classifications through aggregation algorithms removes the subjectivity and individual errors made by the crowd of volunteers, transforming the work conducted by non-professional volunteers into a productive force that can, through these algorithms, be on par with the trained scientists (Kasperowski & Hillman, 2018, p. 584; Kasperowski & Hagen, 2019, p.177). In this sense, the production of useable data on Zooniverse is based upon what Gillespie (2014) denotes as algorithmic objectivity (p. 181).

Consequently, the process of re-centralisation takes place in two instances. First, protocols are used that guides the individual volunteers' classifications as a way to standardise their micro-tasks on the platform and, second, each individual micro-task are subsequently combined by aggregation algorithms into one aggregated classification. On the basis of research performed within the context of social media, Helmond (2015) points upon how "platformization" is also process of reconfiguration with regards to such issues as website infrastructure, an argument that van Dijck, Poell & de Waal (2018) extends to include the transformation of entire societal sectors, a transformation that infers the ability to reshape and reorganise parts or even whole societies. With regards to the issue at hand in this paper, citizen science and scientific citizenship, this section will discuss if and how the Zooniverse actually are making citizen science "platform ready", an approach that oblige the following discussion to begin with how the notion of citizen science have been conceptualized and understood in STS.

Zooniverse: Making Citizen Science "Platform Ready"?

Within STS, citizen science has come to revolve around various aspects of democratic representation, and participation, which within the context citizen science implies a:

> Meeting point between different forms of knowledge and understanding. It also implies the possibility of cross-fertilization within a diverse area of different knowledges. Especially for the institutions of science, it will involve change but also reflexivity in the face of social pressures. Citizen science thus implies the recognition of new social and knowledge relations (Irwin 1995, p. 166).

According to Woolley et al. (2016), this form of representative citizen science has the goal of emancipating science from its traditional institutional and professional setting. On the basis of this interpretation of what citizen science entails, community-based urban planning or environmental projects that are responsive to local needs, as well as the involvement of lay people and their lay knowledge in order to achieve a more democratic governance of science are seen as prime examples of citizen science (Woolley et al., 2016). This democratic governance of science is characterised by dialogue and deliberative decision-making between the public and science in relation to risk and environmental threat (Bonney et al., 2016; Irwin, 1995). As noted by Woolley et al. (2016), the word citizen implies, at its most immediate level, a relation between individuals and the societies that they live within (Woolley et al., 2016). The notion of scientific citizenship infers that the relation between individuals and science is to be seen and based upon dialogue and deliberative decision-making, where the relationship between science and democracy should not 'be about the search for universal solutions and institutional fixes, but rather the development of an open and critical discussion between researchers, policy makers, and citizens' (Irwin, 2001, p. 16). Arguments within STS regarding citizen science and scientific citizenship connects then to discussions and understandings within the field that advocates the need for an increased participation as a way to emancipate science and increase the epistemic representation of citizens. These discussions and understanding, in turn, follows a broader development that sees the need to expand participation into what Carpentier (2011) denotes as "alternative areas".

These are areas that lies outside the more traditional arenas of political decision making, a position that also implies an expansion of what areas or parts of the society that are to be seen as political (Carpentier, 2012, pp. 167–168). As shown above, the model that lies at the heart of this position within STS revolves around a participatory moment that is located within communication, as deliberative democracy refers to decision making by discussion among free and equal citizens (Soneryd & Sundqvist, 2019; Carpentier, 2012, p. 168). The limitations and even incompleteness of deliberative contexts have also sparked an interest as well as discussions within the STS-field, where the need for a proper co-production with regards to science and the use of scientific knowledge within the society is argued for (see for example Irwin, 2001; Elam & Bertilsson, 2003). Nevertheless, from the perspective of democratic theory, the dominating positions and understandings about public participation and engagement within science held by the STS-field can be seen as advocating a maximalist position with regards to participation in science. This maximisation implies a broadening of the set of actors in political activities but also, and maybe more important, also a broadening of the societal spheres that are to be considered as political and therefore also subject to political and democratic discussions as well as different forms of interventions (Carpentier, 2012, p. 169).

With regards to the issues discussed above, the question that lies at core concerns the nature of the participation offered on the Zooniverse platform. Here, a differentiation between access, interaction and participation will enable a more detailed discussion concerning if in fact Zooniverse is making citizen science and scientific citizenship "platform ready". The concept of access is based on presence; for example, presence in an organizational structure or within a community or, as in the case of Zooniverse, presence on the platform and within the research process. Interaction emphasises the social-communicative relationships shaped by actors on the basis of shared interests, purposes and values, or common knowledge (Carpentier, 2012, 174–175). Also, this aspect is provided on Zooniverse, in the form of the discussions forums that are an integral part of the platform's infrastructure, as well as of its epistemic culture. Still, the essential point to be made in relation to the notions of access and interaction is that even if they constitute important, if not essential conditions, for

the possibility of participation, they cannot be equated with participation. The difference between access, interaction (which both can be found on the Zooniverse platform) and participation is connected to power and equal power relations in decision-making (Carpentier, 2012, pp. 174-175). For an STS- audience, the notion of power and equal power relations is not new, and the key aspect revolves around what kind of power relations that is contained in the twin movements of de-centralisation and re-centralisation. On the basis of what has been showed and discussed in this and the previous section, it can be argued that Zooniverse do provide both access and interaction to the volunteers but when it comes to participation in a sense of a co-production of scientific knowledge, Zooniverse still has some way to go before this kind of participation is fulfilled on the platform.

In line with the discussion above on a deficiency of a more radical inclusion of the Zooniverse crowd, previous research shows how this deficiency gives rise to various forms of tensions (c.f Mansell, 2013). Here, Woodcock et. al. points upon experiences of "alienation" among individual volunteers as their classifications does not seem to make much of a difference compared to the total amount of classifications made in each citizen science projects on the platform. Over time, according to Woodcock et. al, the initial excitement and enthusiasm wanes and is replaced by with more negative experiences associated with the classifying the data (Woodcock et al., 2017). Tensions of another kind is discussed by Kasperowski's and Hillman's (2018) investigation of the discussion forum connected to the Galazy Zoo project, identifies how tensions develops in Galaxy Zoo in relation to the standardised protocols that guides and directs the classifying micro-tasks de-centralised to the crowd. Images that do not comply with the standardised protocol captures the interest of some part of Galaxy Zoo's crowd of volunteers, sparking an interest but also expectations that the anomaly might in fact be another "Hanny's Voorwerp", a discovery of an unknown astronomical phenomena (581–582). Often, though, these anomalies turn out to be optical artefacts, either resulting from the telescope that has produced the image in question, or the software involved in the Galaxy Zoo.

In many cases inquiries made by the volunteers about these anomalies end up as topics on the project's discussion forum where sometimes examination and discussion lead up not only to a detailed discussion and analysis of astronomical phenomena but also of imaging artefacts, which involves sharing knowledge and resources (for example different astronomical databases outside the Galaxy Zoo project) for obtaining deeper knowledge among the volunteers. These discussions and subsequent collaborations among the volunteers extend far beyond the main goal of the classifying images of galaxies, which give rise to responses among the forum's moderators, as well as researchers, that encourage the volunteers to focus on the task of image classification rather than pursuing other forms of activities (Kasperowski & Hillman, 2018, pp. 579–580). Arguing from user perspective, Woodcock et al. (2017), means that interactions on the discussions boards at times can be contradictory, being a positive experience as the height of the classificatory activities can be shared and discussed, but also negative when moderators rebuff the volunteer for moving away from the core activity of classifying images (Woodcock et. al., 2017).

The reason for this can partly be attributed to fact that the origins of the platform was not seen in terms of realising neither citizen science nor scientific citizenship, but rather as a solution to the growing problem of handling and managing large data sets. Consequently, the twin movements of de and re-centralisation of the research process employed by Zooniverse came to be a suitable solution to handling and managing large data sets but, as Woodcock et al. (2017) points out, 'the need for reliable and large-scale data shapes the interactions that scientists have with the crowd, seeking to gather a finished data product that can be used in research' (Woodcock et al., 2017). Even though individual projects that are hosted on the platform might approach more radical forms of inclusion in their involvement of the crowd for performing micro-tasks of classifications, the platform as a whole can hardly be seen as fostering a more radical democratic inclusion, for example in the form of a co-production of scientific knowledge, that dissolves the institutional borders between scientists and non-professional volunteers (Soneryd & Sunqvist, 2019; Elam & Bertilsson, 2003). Another reason can be traced to the highly structured and controlled participation that are intrinsic to Zooniverse's design also yield an imbalance of power between researchers and volunteers. Following Gillespie's (2015) observation that 'platforms shape the social dynamics that depend on them', and that their 'technical design, economic imperatives, regulatory frameworks, and public character, have distinct consequences for what user are able to do, and in fact do' (p. 21), the tensions discussed above can also be seen as a reaction and a resistance to the way the design of the Zooniverse platform contains intrinsic relations of power and authority.

In their investigation, Kasperowski and Hillman (2018) understands the issues discussed above in terms of a central tension, or paradox, the epistemic culture on Zooniverse. Volunteers are mobilised into this epistemic culture as a distributed collective, and an overwhelming majority of the contributions made to the scientific process will be as a collective, where individual classifications are combined through aggregation algorithms into useable data for science. However, the prospect of individual discoveries, like the one made by the Dutch schoolteacher Hanny van Arkel, is also very much part of the epistemic culture within Zooniverse (p. 582). Experiences of "alienation" and instances when volunteers step outside the formulated and standardised micro-tasks that constitutes the main work performed on the platform is then experiences that can be seen and understood in cultural terms. Nevertheless, as shown in this section, these issues could also be seen and understood in terms of the dual "platformization" process of de-centralisation and re-centralisation. Against this background, the initial question posed in this section whether

Zooniverse can be said to make citizen science "platform ready" have to be answered negatively in as much as we understand citizen science in terms as encompassing a more radical inclusion of the public in the production and usage of scientific knowledge.

Concluding Remarks

The Zooniverse platform signifies a novel development within the field of citizen science and scientific citizenship. It offers, through a process of "platfromization", a direct and highly accessible way for the public to become part of the production of scientific knowledge. However, as shown in the last section of this paper, this direct and accessible way comes with a price in relation to what kind of engagement offered to the public. Whereas the platform does offer both access to (become part of scientific research) and interaction among (volunteers and researchers), it cannot be said to offer a more radical form of inclusion in the production of scientific knowledge. In this respect, the highly structured involvement of the volunteers yields a power imbalance between volunteers, researchers and the platform itself.

However, this aspect also depends on the definitions and understandings of citizen science and scientific citizenship. Since its formulation for almost twenty-five years ago, the field has undergone a rapid development, especially as a consequence of the development within digital technologies. Zooniverse is a prime example of this development. Apart from setting the light on what kind of inclusion and participation that is offered on Zooniverse, the platformization of citizen science and scientific citizenship also sets light on what we actually mean with these two concepts. Maybe we have to make a differentiation between various forms of citizen science and scientific citizenship that will enable us to pinpoint and discuss what various actors refer to when they make use of and designates their activities as citizen science or as fostering a scientific citizenship. To be fair, Zooniverse themselves designates their form of public engagement as a people-powered research, a designation that does not exclude an analysis performed in this paper, but which nevertheless sets light on the various terms that exists and are use. In order to avoid that the notion of both citizen science and scientific citizenship becomes watered down and losses its meaning, further research and discussions on processes of "platfromization" and consequences of the digital development is needed.

Declaration of Conflicting Interests

The author declares that there is no conflict of interest with respect to the research, authorship, and/or publication of this article.

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"BEST BEFORE, OFTEN GOOD AFTER"

Re-Scripting the Date Label of Food in Norway

by Tanja Plasil

In 2018, several Norwegian food producers added a new phrase to date labels of packaged foods: best before (date), often good after. Why and how did they do this? By using two concepts from Actor-Network Theory, translation and script, this article reveals how a seemingly simple addition to a label can reveal underlying issues and policies. This case study sheds light both on how the script of the date label was used to translate UN Sustainable Development Goal 12 about food waste reduction into everyday use and practice and how the date label moved from the domain of food policy making towards the realm of environmental politics.

Keywords: Date label, UN Sustainable Development Goals, Translation, Food Policy, Script

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Introduction

In January 2018, the largest Norwegian dairy company, TINE AS, held a social media poll on their Facebook page asking followers to choose wording options for a supplementary phrase that would be added to the original expiration date label of food, *best before*. They asked their followers: *What do you vote for? The phrase you like best will be used on our products to remind us all to waste less food*. Their post was viewed 212.000 times, shared 70 times and commented on 675 times. A week later TINE announced that option three: *men ikke dårlig etter* (English: "but not bad after") was chosen above the two other options: *se – lukt – smak* (look, smell, taste) and *og ofte god etter* (and often good after). However, after having been in use for only a few months TINE AS changed the wording again to *best før [date] ofte god etter* (best before [date] often good after"). The poll may seem trivial, but it speaks to an underlying problem, namely food waste, an issue seen as increasingly problematic not only in Norway but global. Goal No 12 of the 2030 UN Sustainable Development Agenda states:

> "Each year, an estimated 1/3 of all food produced – equivalent to 1.3 billion tons worth around $1 trillion – ends up rotting in the bins of consumers and retailers, or spoiling due to poor transportation and harvesting practices." [1]

Besides the moral dilemma and financial costs, food waste also produces unnecessary energy consumption and greenhouse gas emissions. According to the UN Sustainable Development Goals food productions stands for 30% of the world's energy consumption and 22% of greenhouse gas emissions. While in the Global South most food waste happens during harvest and transport, in the Global North consumers are largely responsible for food waste. Recent research in Norway shows that 58% of food is wasted at the household level (Elstad Stensgård et al., 2018). Consumer food waste is a problem that needs to be addressed. In Norway one approach has been to focus on the wording of the date label of non-highly perishable goods: *best before (date)*. In 2017, several Norwegian food producers started labelling their products with a voluntary, supplementary sentence:[2] *best before (date) often good after*.

In this article, I show how global objectives like the UN Sustainable Development Goals are being translated into everyday practice through the construction and re-construction of everyday tools and technologies. More precisely, the focus point of this article is not a political figure, grand scheme or social movement but a seemingly simple, mundane, everyday technology: a date label. It is treated not as a "mere prop for social action" (Prout, 1996, p. 199) but as an actor actively shaping and being shaped by social processes and practices. Following the date label through time shows "how ordinary objects and technologies are made to speak for politics" (Woolgar & Neyland 2013, p. 3).

Adding words to the expiration date, even though seemingly trivial, is emblematic for wider changes that happened in society since the implementation of the original date label in the 1970s. As I will show below, originally, standardizing the natural and unpredictable lifetime of food into a pre-set, calculable and effective shelf-life time helped to secure food safety and quality and guaranteed a smooth working of the market. However, unforeseeable for the makers of the original date label, it changed how consumers perceived and used food products. Following what they thought is the prescription of the shelf-life time rather than their own senses, consumers often discard food prematurely. This issue recently has received ample attention in the media (e.g. "Norwegian consumers have date fear" in Adressa, April 2018[3]), in reports (e.g. Stensgård et al., 2018) and in international academic publishing (e.g. Evans, 2012; Watson & Meah, 2013; Aschemann-Witzel et al., 2015; Bilchfeldt et al., 2015; Yngfalk, 2016; Aschemann-Witzel et al., 2018; Mattila et al., 2018; Närvänen et al., 2020). Today the date label is one of the most important means to determine the quality of food (Plasil, 2020) while at the same time causing unsustainable (household) food waste. I argue that the date label has changed from being exclusively a means for food policy regulation to an environmental issue. By using two concepts from Actor-Network Theory, *translation* and *script*, I will show *why* and *how* this move has happened, who the important actors were and what this tells us about the underlying politics of the time.

On scripts and translations

In Actor-Network Theory (ANT) actor-networks are heterogenous and shifting assemblages in which human and non-human (nature, technology) actors are brought together to execute certain actions (Latour, 2005). Central in the mediation between objectives and action are the concepts of *translation* and *script*. In this context *translation* is the "mechanism by which social and natural worlds progressively take form" (Callon, 1986, p.19). Through translation entities enrol and speak for each other (Law, 1992; Prout, 1996). This is a process before it is a result (Callon, 1986). This process is about reaching a settlement about often

1 UN Sustainable Development Goal 12 can be found here: https://sustainabledevelopment.un.org/sdg12

2 In Norway it is called "supplerende datomerking" (supplementary date labelling)

3 https://www.adressa.no/nyheter/okonomi/2018/04/18/N%C3%A5-blir-det-mulig-%C3%A5-kj%C3%B8pe-mat-som-er-g%C3%A5tt-ut-p%C3%A5-dato-16504214.ece?cx_Deling=AddThis

conflicting priorities of a variety of actors and between the objectives and strategies of human actors and the performances of technical and natural actors (Beveridge & Guy, 2009, p.72). The more actors are committed, the more stable the network.

In order to be made real, imperatives, issues and goals have to be translated into everyday practice and understanding, thereby becoming embedded in relations between actors. Seemingly humble and mundane technologies like a label can perform these translations. "If political rationalities render reality into the domain of thought, these 'technologies of government' seek to translate thought into the domain of reality" (Miller & Rose, 2008, p.32). However, this is an ongoing process: "for an actor-network to be extended over time and space, for power to be exercised at a distance, the actor-network has to be constantly produced and re-produced in socio-technical relations" (Beveridge & Guy, 2009, p. 73). It has to be translated and re-translated in very specific contexts of time and space through shifting constellations of actors (McLean & Hassard, 2004, p. 494). The case-study presented below shows how global goals are translated into everyday practice through the seemingly simple and mundane technology of date labelling. What is happening in Norway at the moment is a *re-scripting* of the date label, adding a voluntary, supplementary phrase to clarify how the expiration date should be understood and used.

In this article I deal with two notions of script. According to Akrich (1992), technologies (in the widest sense) contain a *script*. This script is based on the assumptions and hypotheses makers have about future users, it is "inscribed" into the objects or technologies and "prescribes" a specific use (Akrich, 1992, p. 208). The date label can be conceived as a double script: it *is* literally a script, printed on the package but it also *contains* a script, prescribing a specific understanding and use. However, this *script*, when moved through time and space, meeting different actors and objects, might take on different meanings and understandings through an ongoing negotiation process. Here the concepts of *translation* and *script* meet, and the messy translation processes takes the form of different *scripts*.

The issue of food waste, and its threat to global environmental sustainability, redirected the perspective and goals connected to the date label. Its original script (*best before*) was scrutinized and questioned. New actors emerged and traditional relations and political approaches were transformed. These changes, combined with the modified objectives and strategies of human actors, rendered the performance of the government technology date label not "up to date" anymore. Following the date label through time shows how these changes in actors and approaches have manifested in the *re-scripting* of the expiration date.

Methods

By following a tool or a technology one can discover the different networks, assemblages and actors working on it and being worked upon and thereby identify wider issues, problems, politics and ideas. This case study is built on interviews, and first- and second-hand documents. Informants were selected based on their key roles within the processes and policies related to the (re)scripting of the date label both in the 1960/70s and today.

Eighteen semi-structured interviews were conducted with 24 people about date labelling in general and the supplementary date label in particular. Sixteen informants were active in either the dairy industry (one of the first sectors where the supplementary date label was used) or in other parts of the food retail and production sector (for example Coop, Norgesgruppen and Asko). Further, I interviewed two employees from Forbrukerrådet (Norwegian Consumer protection agency), two from Matvett (the food and catering industry's interest organisation for the reduction of food waste),[4] two from Mattilsynet (Norwegian Food and Hygiene Authorities) and two NGOs against food waste. Interviews were taped and transcribed and then colour coded to identify patterns and recurrent themes. I also took part in sector meetings like the *The Nordic Food Waste Conference* in Oslo in 2017 and the *Consumers in a Sustainable Food Chain Supply (Cosus) Conference* in 2017. Both conferences were taped, transcribed and colour coded (using the same codes as in the interviews).

To position the interviews in a wider context and to analyse the changes in ideas and issues over time, national and international law texts and reports were consulted and analysed, including the Codex Alimentarius (1962), the debates in both chambers of parliament (May 3 and 10, 1968), the Law about Food Labelling 1968, the Regulations about Food Labelling (1975, 1986, 1993) and the Food Information Regulation 2014 based on EU1169/2011, the UN Sustainable Development Agenda (2015) and the *bransjeavtale* (trade agreement) between government and food and hospitality industry of 2017. Furthermore, all issues of the *Forbrukerrapporten,* the quarterly magazine published by the Consumer Agency (1958-2010) and several newspaper articles from the 1960s and 1970s about the original date label and in the 2010s about the supplementary sentence were reviewed to gain insight into how ideas around food labelling and food waste changed over time in Norway.

Besides traditional media, I also conducted social media research, focusing on the aforementioned Facebook poll by TINE AS. All

4 The company was founded in 2012 is owned by the Interest organisation of Food and Beverage, the Foodservice Suppliers Association (DLF), the Grocery Store's Environment Forum and Interest organisation Tourism. Its main goal is to reduce food waste in Norway.

comments were printed and sorted according to the given answers and comments. The most interesting comments were from those voters who elaborated on their thoughts about this addition. Useful insights into consumers' perceptions and ideas about date labelling in general and the supplementary date label in particular could be gathered by this.

Between September and November 2018, I conducted an Internet survey among consumers in collaboration with NOFIMA (Research institute for applied research within the fields of fisheries, aquaculture and food), which 373 people filled out. The data was coded and analysed (the two open questions offered particularly helpful insights into consumers' ideas and knowledge about the date label). As this overview shows, the complex techno-social assemblages and processes required a *multi-methods* approach (Brewer and Hunter 1989) that could handle and integrate different types of data.

From Issue to Regulation – Translating Consumer Needs into the Date Label

Most food items are ephemeral and perishable (Watson & Meah, 2013; Mattila et al., 2018) making them fun and frightening at the same time (Fischler, 1988; Rozin, 1999). Naturally, food deteriorates and loses its quality over time. The date label was put in place in many countries during the second half of the last century to reshape nature (food) into measurable and calculable units (Asdal, 2004). It is "through technologies that political rationalities and the programmes of government that articulate them become capable of deployment" (Miller & Rose, 2008, p. 63). In other words, the date label emerges as a means to deal with the perishability of food, translating the process of natural decay (natural time) into standardized, predictable shelf-life time. This legislation was based on high-modernist ideas (Scott, 1998) and a strong sense of "technocratic optimism" about science and technology solving most of humanities' problems (Myrvang et al., 2004).

The issue at stake was the problematic combination of the perishability of food and a growing industrialization of food production, which altered consumers' relationship to food considerably. New production and storing methods, food imports, the supermarket revolution (Olsen, 2010) and new packaging technologies like freezing, vacuum packing and tinning (see e.g. Finstad, 2013) distanced consumers from food production and made it more difficult to judge the age, safety and quality of food items (Sassatelli & Scott, 2001; Poulain, 2002; Kjaernes et. al., 2007; Eden et al., 2008; Zachmann & Østby, 2011). This was deemed problematic by two actors within the consumer and food policy network. The recently founded Consumer Agency (Forbrukerråd)[5] and the Norwegian Labour Party (*Arbeiderpartiet*) who committed themselves to improving consumers' rights and advocated for a far-reaching law for consumer information and the labelling of consumer goods (including food). Guri Johannessen from the Labour Party for example argued that "consumers have a right to get basic information about products. There is a need for regulations that primarily focus on consumers' interests" (point made during the 112. Ordentlige Stortingsforhandlingen (discussion in parliament) in Odelstinget, May 3, 1968).

To translate this issue into practice more actors had to be enrolled and technologies of government had to be constructed. To achieve this goal two strategies were chosen. First, consumers, still generally unaware of the issue, were enrolled by informing them about their rights and to the possibility to "vote with their fork" (Rem 2008). Articles like for example "Skillful consumers – a path to a higher standard of living" (May 1958) or "Think before you buy" (December 1958) in the abovenamed *Forbrukerraporten* were used to do so. Second, the issue had to be translated into practical politics and government technologies. This had to be done against considerable opposition by both the food industry and more conservative political parties like *Høyre* (Convervative Party) and *Senterpartiet* (Centre Party). The fear was that a one-sided law would put Norwegian production, import and export at a disadvantage. When looking at the paperwork (reports, propositions, transcriptions of parliamentary debates) one can see how the original far-reaching law for product labelling, marketing and control was subsequently reduced to a pure labelling law, which was put into effect on May 24, 1968.

The law was followed by the National Regulation of Labelling of Consumer Goods (*Forskrift om merking av forbruksvarer)*[6] issued in 1975 by the Ministry for Consumers and Administration, which transformed the law into more concrete regulative policy. The issue of the perishability of food combined with the challenges of industrial food production and packaging had been translated into one, nation-wide regulation. The unpredictable natural lifespan of food was standardized into shelf-life time, taking away consumers' insecurities about the quality and age of the food they were about to eat.

The newly established government technology date label was then able to "conceal for a time the process of translation itself"

5 The Consumer Agency was founded in 1953.
6 https://lovdata.no/pro/auth/login#document/SF/forskrift/2014-11-28-1497?searchResultContext=1222&rowNumber=1&totalHits=51

and turned "a network from a heterogenous set of bits and pieces each with its own inclinations, into something that passes as a punctualized actor" (Law, 1992, p. 386). Once a system or a technology is in place, the politics that led to it are often forgotten (Bowker & Star, 2000). The date label became "black boxed" (Latour, 1987, 1999) and the technical and scholarly work that had gone into it was rendered invisible to its users (*reference anonymized for review purposes*). The date label not only *delegated* the networks, decisions and actions that went into it, extending it through space and time (Latour, 1991; Prout, 1996) but also many consumer decisions and considerations were delegated to the expiration date.

This label enables people to shop, and later eat, without making decisions within a wide array of topics – from hygiene and safety to legal and moral questions about value and waste. The expiration date is thus not a neutral label that describes a reality, but it produces the exact realities that it is describing (Asdal, 2015). A new issue arose due to a rising gap between what the creators of the date label had *in-scripted* into it and how its users came to understand it.

Two Scripts, One Interpretation and the Growing Amounts of Food Waste

By legally pre-scribing date labels, the creators did not only literally inscribe a date on the package but they also *pre-scribed* a certain use, a relationship between the user and the product, imagining a path for future actions of users (Woolgar, 1991; Akrich, 1992). With the National Regulation of Labelling of Consumer Goods from 1975 two scripts had been created: *A use by (date)* and *a best before (date)*.[7] Highly perishable food (like fish or chicken) products have to be labelled with a use by date telling them the product is unsafe to consume after the date has passed and should be discarded. The other version of the script, the *best before* date informs the user that, according to the producer, the qualities (smell, taste, colour, content etc.) might deteriorate after the date. This date alerts consumers that a food item might not be at its best anymore but presumably could still be consumed without endangering a person's health. It was believed that these two versions would make it easy for consumers to distinguish between safe and unsafe food on the one hand and between optimal and sub-optimal on the other. However, many complex properties and qualities of food products (the outcome of the industrial food production process) are condensed into the script of the date label (Plasil, 2020) which makes it, even though mundane and simple at first glance, a complex and difficult *script* for consumers to use.

Unanticipated, consumers re-interpreted the two scripts and merged them into one – treating the quality related *best before* date as synonymous to the safety related *use by* (Evans, 2012; Watson & Meah, 2013; Aschemann-Witzel et al., 2015; Bilchfeldt et al., 2015; Yngfalk, 2016; Aschemann-Witzel et al., 2018; Mattila et al., 2018; Närvänen et al., 2020). Rather than using it as a guideline, consumers came to see the *best before* date as a threshold that should not be crossed. Far from being easy about wasting food, consumers still do so because they believe that a product is not safe or at least not pleasant to eat once the *best before* date has passed (Aschemann-Witzel et al., 2018, p. 170). The following quote from the survey illustrates these perceptions:

> "I am one of those people who throws away food immediately once it is out of date. I know I can smell it, and I do that, but once it is expired, I feel it smells bad and the carton looks blown up" (open question response in survey, September-November 2018).

Note how the date not only replaces the senses in the process of deciding what to eat and what to throw away, but also induces a particular perception (carton *looks* blown up), overriding the evidence provided by the senses. This perception of food caused by the misinterpretation of the *best before* date is an important contributor to growing amounts of food waste (European Union Committee 2014; Stensgård & Hanssen, 2015; Norstat Survey, 2016; Stensgård et al., 2018). "Cracks" in the *black box* date label became visible (Paxson, 2016), making it possible to re-construct and *re-script* it. The date label moved from being a food policy technology, guaranteeing food quality and safety, to becoming a "villain" in the fight against food waste (environmental politics). However, all my informants (even from NGO's fighting against food waste) agreed that simply removing the *best before* date would not be the solution as food quality cannot be sacrificed on the altar of sustainability:

> "Quality is a tricky balance. It is an illusion, I think, thinking that consumers would eat food that they do not think is nice. We are such an affluent society that I cannot believe that Norwegian consumers would eat food that they do not experience as good. And if you have a shop that is full of old products, it is another supermarket chain that will survive." (Interview Norgesgruppen, February 2018)

As this quote shows, it is an illusion to think that consumers today would accept poor quality or even insecurity about the age of food products. Today's consumers have high expectations about the food they want to purchase and use (De Hooge et al., 2017). How, then, to solve the of sustainable food production and consumption without sacrificing quality? How to reconcile individual consumer needs for

7 See Forskrift om matinformasjon til forbrukene (matinformasjonsforskriften) (Regulation on the provision of food information to consumers) from 2014.

food quality and safety with a collective need for more sustainable food chains? In what ways were global goals translated into local policies in order to achieve better environmental sustainability without touching too much upon food quality and consumer information? The events described below show how the re-scripting of the date label was an attempt to reconcile these different issues.

Translating UN-Goals into Local Policy

UN Sustainable Development Goal No 12 states that by 2030 the amount of food waste should be substantially reduced through prevention, reduction, recycling and reuse and explicitly mentions consumers and the need to educate them towards sustainable consumption and lifestyles (UN, n.d.). However, *how* this should be done is not outlined (Beveridge & Guy, 2009, p. 74) and as the UN lacks executive or coercive powers within nation states, these goals have to be translated into action on a local level, with local actors and local technologies.

Several steps were needed to translate these global goals into national policies and practical use. First, the government needed to find allies in the fight against food waste, and an agreement between industry and the state was reached. In June 2017 five ministries (headed by the Ministry for Climate and Environment) and 12 organisations representing food industry and trade signed the *Bransjeavtale om reduksjon av matsvinn* (Trade Agreement about the Reduction of Food Waste) (Government of Norway, 2017). Using voluntary agreements between government and food industry rather than enforcing strict rules to achieve certain policy goals is the norm in Norway as this statement from a researcher from Østfoldforskning[8] shows:

> "This is more the Norwegian way, to have voluntary solutions. One has done the same with the recycling of packaging, called Green Point, which was also a voluntary arrangement." (Interview Østfoldforskning, June 2017)

However, besides being the 'Norwegian way,' it also exemplifies a general shift in politics and policy making (not only in Norway but worldwide). After mandatory and enforced regulations that were the tools of the high-modernist discourse in the 1970s (Bull, 1990 [1982]; Stenersen & Libæk, 2003; Myrvang et al., 2004) there was a global shift towards voluntary agreements and self-regulation of the market within the neo-liberal system of today (Stenersen & Libæk, 2003; Venugopal, 2015; Pyysiainen et al., 2017; Frohlich, 2017). In accordance with UN Sustainable Development Goal 12.3., the agreement states that industry and state will work together to reduce food waste by half by 2030. The agreement explicitly maintains that both industry and government shall take action to help consumers wasting less food (Trade Agreement, 2017). The next step, after enrolling the industry into the network for reducing food waste, now consumers had to – once again – be enrolled. But how to reach the consumers and how to help them waste less food?

In my interviews[9] I found that producers and government authorities generally identified the misinterpretation of the two scripts as the main issue that had to be resolved. The date label became the main actor that had to be worked on and its script may not only be the source of the problem but might offer a solution as well.

Re-Scripting the Date Label

During the 2017 Nordic Food Waste Conference organized by the Nordic Council of Ministers in Oslo, Norgesgruppen, Norway's largest food retailer/producer presented a pilot project for testing an additional date on the food label. The head of the sustainability department, explained:

> "It is a pilot project and it is run on a series of yogurt products that we have. The goal is to reduce food waste, not our own food waste but the consumers' food waste. It is also to increase the awareness of what the best before date means. The additional *normalt brukbar til* (normally useable until) indicates how long it normally can be eaten, even if not all the aspects of the quality are still there." (Chief advisor Sustainability Norgesgruppen)

From this statement it becomes clear that – at least in this case – rather than focusing on their own waste production, this company saw the more detailed information of consumers as the main path forward. After this short presentation, a discussion started between people who praised this idea as helping consumers to understand the expiration date and those who believed that additional information would confuse them. Here are a few opinions of the day:

> "My first thought is that I'm concerned that it's confusing. This is plan B, this is when we decide that we are not able to educate the consumer about the meaning of the best before date, then we use this. I'm not ready to give up that we can educate the consumer to use their senses." (Veterinary from Danish Food Administration)

8 Østfoldforskning is a national research institute focused on knowledge about sustainable social development. https://www.ostfoldforskning.no/no/om-oss/

9 This is supported by the abovenamed literature on the topic.

> "I think we should look at this initiative as an "in addition to" not meaning that we should give up educating consumers. With the information so close to the date label, and not on a web site or far away from the purchase moment." (CEO Matvett, Interest organisation for the reduction of food waste)

> "I think it's very important that when we talk about labelling is that we're aware that labels should be uniform for all kind of products. And it should be easily recognized from different types so that you will always find the same information in the same way. So, you don't make differences between products." (Norwegian Food Safety and Hygiene Authorities).

These three statements reveal several competing concerns, needs and priorities. The two employees of the food authorities from Norway and Denmark were much more concerned with a uniform, standardized and non-confusing message towards consumers, which furthermore would not make (marketing) differences between products. The CEO of the industry's interest organisation to reduce food waste (Matvett) understandably had more the waste-reductive powers of a possible new script in mind than uniformity and standards. However, even though no concrete agreement on how to inform the consumers best had been reached that day, it was clear that the strategy of the Norwegian government was working in practice. The food industry was offering a possible solution by presenting the idea during an international conference, new actors could be enrolled (even though not all agreeing with the strategy – yet) and new coalitions became possible. The date label had "officially" been identified as the technology that could bring about change and its *best before* script became the tool to be worked on. In order to make explicit to consumers what the *best before* script meant (possibly reduced quality but most likely edible) and how it should be used (do not throw away but check it) a new *script* was in the making.

However, Norgesgruppen were not the only ones working on re-scripting the date label. While they were busy testing and surveying their pilot,[10] another food producing company, Q-Meieriene (Q-Dairy), had their own approach. Q-Meieriene surprised the industry and the authorities with their own supplementary date label: *best før (dato) men ikke dårlig etter* (best before (date) but not bad after). According to the CEO of Q-Meieriene they had responded to a challenge put in front of them by an activist and blogger (*Spis opp maten* or Finish your food) (with approximately 30,000 Facebook followers). In March 2016, on national channel TV2, this activist challenged food producers to address the fact that date labels contribute to unnecessary consumer waste. According to her, Q-Meieriene was the only company responding, and they agreed to add her suggested *but not bad after* to the original date label. Here we can see the engagement of yet another group of actors – besides government, industry and interest organisations also activists became involved in the process of re-scripting the words and *re-scripting* the use of the date label. While new actors emerged, some previous actors (Consumer Agency) were absent from the scene and others (government and political parties) acquired new, less prominent roles as the following will demonstrate. In the first half of 2017 two different supplementary date labels were in use.[11] This alarmed the Norwegian Food and Hygiene Authorities, Mattilsynet, who feared that differing scripts would lead to confusion rather than clarification among consumers. One of their employees explained the legal backdrop: "The Food Information Regulation says that if you provide voluntary information, this information should not be misleading, it should not be ambiguous and should not confuse" (Interview with senior advisor Mattilsynet, February 2018).

To reach an agreement within the industry two meetings were held. In November 2017 Mattilsynet explained their viewpoint and the legal requirements of any supplementary date labelling. After giving a presentation about the legal requirements, Mattilsynet left the scene to the guidance and coordination of Matvett, an interest organisation owned by the Norwegian food industry, aimed at the reduction of food waste. In order to reach a consensus, Matvett called for another meeting at the beginning of 2018, where several important actors from the food industry (including Norgesgruppen, TINE and Q-Meieriene) agreed on one, uniform, voluntary supplementary date label. During this meeting they decided that the new script would be *best before (date), often good after*. One of the reasons for deviating from the already existing but *not bad after* was that meat producers could not guarantee 100% safety after the *best before date*. This meant that TINE AS, the example from the beginning of the article, had to change the supplementary date label from *not bad after*, which they had already started using, to *often good after* even though consumers had voted otherwise. Against consensus within the industry, Q-meieriene decided to keep *not bad after*.[12] The reason to do so was not only that their supplementary label had already been established and was widespread, but they also considered this a stronger message.

I discovered the same assumptions when reviewing the aforementioned TINE Facebook poll. Besides voting for their favourite wording many left positive comments. There were however several critical voices, accusing TINE of being a copycat from Q-meieriene. This shows that these consumers interpreted

10 Their approach of adding another date onto the label did not prove to be practical in the end. The possible danger of consumers confusing the two dates in addition to the danger of the dates being confused in the printing process led to the abolition of this approach. Furthermore, Norgesgruppen agreed that there should be a uniform wording for date labels in Norway.

11 One by Norgesgruppen and one by Q-Meieriene and later TINE AS.

12 Being asked about their preference only 15% of the respondents of the survey preferred "not bad after". The reason for this many stated was that "bad" sound too negative.

the supplementary sentence as a creative, fun marketing strategy that had been copied by TINE, rather than a coordinated campaign for consumer information for which a single and unified wording would be necessary. This interpretation also opens questions about the underlying objectives within the food industry besides helping consumers to better understand the date label. This quote taken from an interview with Norgesgruppen shows that the underlying goals were two-fold:

> "The environmental plans were primarily about our own operations, but in the field of food waste we saw that we were dependent on cooperation in the food chain to solve some of the challenges. After working on the theme for many years, it has also been natural to take action towards the consumer and there is probably a certain reputation effect that is part of the motivation." (Chief adviser sustainability, Norgesgruppen, February 2018)

This quote shows, first, a commitment to a more sustainable production but, second, an ambition to boost Norgesgruppen's reputation as a green, sustainable and consumer friendly company in the eye of the "consumer-citizen" (Neilson & Paxton, 2010). It is easier to change words on a label than essentials within production and consumption. The question is now, will the supplementary date label have the desired effect of successfully translating sustainability goals through changed user practice?

A Process - Not a Result (Yet)

As stated before, translation is a process before it becomes a result (Callon, 1986). The Norwegian approach of changing the script of the date label has not stabilized yet. Many actors were enrolled in the process: the Norwegian government and food authorities, large parts of the food production and retail industry, interest organisations and activists. The newly adapted date label is settling into the food market. By the end of 2019 several products were labelled with the supplementary label (mainly dairy products but also eggs, orange juice, flour, and flat bread) and one of the main supermarket chains stated that they would label all their products with the supplementary label.[13] Sweden announced that it will follow the example of its neighbour (SVT Nyheter, 2018) and there has been international media attention for the 'Norwegian way' of re-scripting the date label in order to address household waste.[14]

However, there are still two competing supplementary date labels, which could lead to further consumer confusion and irritation within the industry. Some of the actors I spoke to are still reluctant to implement the new script for several reasons. There was discussion within the industry around how much money and effort should go into redesigning existing labels to accommodate the new phrase. For one smaller dairy company for example the costs were not (yet) worth the (uncertain) results. They also claimed that the two parts of the phrase mean the same:

> "Can we not rather look at what best before really means? This supplementary text actually says exactly the same that best before stands for." (Interview Rørosmeieriet, March 2018).

Furthermore, while the interest organisation for waste reduction within the industry, Matvett, is promoting the supplementary date label (Matvett, n.d.), the Consumer Agency was less enthusiastic. They had neither been actively involved (something they did not approve of) nor were they convinced that consumers should be the main focus in the food waste discussion: "producers should not delegate their responsibility towards consumers but look at their own waste as well." They were also concerned that what consumers really need is the longest possible shelf-life, not "just" changes in the script (Interview with Forbrukerrådet, September, 2018).

The question remains how much the change in the script will influence the use of the date label. At the moment of writing it is not possible to quantify the influence of the addition of *often good after* to the original *best before* on consumer waste behaviour and household waste directly (by consumers reading and adhering to the phrase) and indirectly (due to media raising public awareness of the waste problem). The latest report on food waste in Norway is from 2018 and therefore does not contain data about the change in wording (Elstad Stensgård et al. 2018). When asked about their thoughts about the supplementary date labelling many respondents from the survey answered positively. Here some representative quotes:

> "I think the new labelling is positive, it makes us more aware that date labelling is not crucial to the use of the product. The new date labelling has started discussion about food waste."

> "It is good that they now use *often good after*. You are a little more confident that it is possible to eat food after the expiry date. Especially since I live with a person who is very picky about food when it comes to the expiration date."

> "Good! I feel safer to eat a product after the date."

13 https://www.rema.no/artikler/nyheter/vi-merker-alle-egne-varer-med-ofte-god-etter/

14 Documentary on Spiegel TV: Teller statt Tonne, 3rd of March 2018. https://www.zdf.de/gesellschaft/plan-b/plan-b-teller-statt-tonne-100.html; Norway's Top Dairy Introduces 'Best Before, but Not Bad After' Label to Fight Food Waste, 9th of January 2018: https://www.dairyreporter.com/Article/2018/01/09/TINE-changes-label-after-Facebook-campaign-to-Best-before-but-not-bad-after; Norway's Top Dairy Introduces 'Best Before, but Not Bad After' Label to Fight Food Waste, 10th of January 2018: https://www.thedailymeal.com/drink/norway-introduces-best-by-not-bad-after-label

Others were less enthusiastic and experienced the supplementary sentence as "tautological as *good after* is the same as *best before*" or "confusing". A few respondents even saw the whole change as a marketing campaign: "It is all about marketing and competition to get their product sold. The products have the same durability as before," while others were positive but admitted this would not change their buying habits.

Interestingly 77% of the respondents answered that the new script explains the meaning of the date label better and 64% admitted they felt safer to use out-of-date products due to the supplementary date label. However, at the same time 67% of the same respondents answered that they do not need the addition as they *do* understand the original *best before* well enough. Many explained in the open questions that even though they thought it was a good idea and might be important for others for themselves it was not necessary as they knew the right use of the best before label already before.[15] This shows that the process has not settled and that not all necessary actors have been equally successful enrolled in the network yet. In order to be effective, the addition to the date label has to be translated into action, made real and its recommendation has to become as entrenched into the minds and practices of consumers as the first part of the sentence is.

Conclusive Remarks: Making Sense of the Process

By using the two concepts of *translation* and *script* this case has shed light on how global issues and goals can be put into action and practice. The UN Sustainable Development Goals were translated into use by enrolling different actors into the network and by activating the persuasiveness of the date label. The outcome of the *translation* process was an addition to the script, which performed the function of *a script*.

Following the date label through time reveals the changes and shifts that happened between the construction of the original date label in the 1960s/70s and its re-scripting today. The date label has moved out of the exclusive realm of food policy and into the domain of environmental politics. The misinterpretation of the *best before* script led to great amounts of avoidable food waste – a problem that had been identified by scientist, media, activists, and by (supra) national governing bodies. However, the same actors realized that abandoning the *best before* date altogether would sacrifice the individual need for food quality and security. The challenge was how do reduce household food waste without reducing the need for consumer information and food quality. Looking at both, the scripting and re-scripting of the date label, it is possible to identify processes of translating issues and goals into practical politics and daily use through the enrolment of different actors and the employment of technologies for governing. This is a messy process with changing actors, approaches and goals.

In the 1960s/70s the Consumer Agency together with Norwegian Labour Party promoted the issue of food quality and consumer education against the competing needs of the food industry and several conservative parties. During the recent changes the government and even the food authorities acted rather from the side lines, leaving the initiative to the food industry, its interest organization and individual consumer activists. This shift in agency marks a change from a high-modernist (change through state rules and regulations) to a neo-liberal economic-political agenda promoting not only "a withdrawal of the state from market regulation, but the establishment of market-friendly mechanisms and incentives to organize a wide range of economic, social and political activity" (Venugopal, 2015, p. 172). The new assemblages of human actors around the date label, the shift in taking action from government to industry and the transfer of responsibility from the collective to the individual that are visible in the re-scripting of the date label exemplify this change. However, not only the actors changed but also the way in which issues were translated into practice. Instead of using binding legal regulations like in the 1970s, today's addition is done on a voluntary basis and although the original date label could and did not enforce compliance from all consumers (e.g., dumpster divers) the *often good after* leaves even more room for consumer interpretation as it is not absolute but relative to individual food items. The neo-liberal individualization manifests itself in shifting responsibility for taking the "right" decisions, moving the food products economically and sustainably away from not only the government and its agents but also from producers and towards the consumer.

Here I want to add some critical notes about this change. First, it is of course easier to change words than people´s behaviour. Or rather, changing a script is easier than making the new script effective. As not only the statements about the continuing necessity of consumer education during the Nordic Food Waste Conference but also some of the quotes from the survey show, changing words might remind people to use their senses but may not really change consumer attitudes and practices. This has possibly to be done on a different level than on the label, starting at a young age, instilling trust in the senses again rather than in government and industry standards. This will take a more concerted (and possibly more expensive) effort from the government and authorities working with food, consumers and education – not only on a national but also an international level. Second, while this approach shifts responsibility – yet again (Evans, 2011) – away from the industry towards the consumer, who is

15 This understanding of the date label could stem from the fact that people who are more interested in the topic and therefore already better informed are generally more likely to fill in surveys that those who are not.

expected to make environmental responsible choices; the constant availability of cheap food, large packages, 3-for-2 offers and a market of ever fresher, more short-lived and constantly changing products, flavours and food fashions lie deeper at the heart of the problem than the wording of the date label. Third, and connected to the two criticisms above, even producers admitted that the change in words was not only done for pure environmental but economic reasons as well. Changing words to make products *look* environmentally responsible is after all easier than changing production, retail strategies and marketing in essentials.

It is not easy to predict how the addition to the date label will help reducing household food waste. The process of translation is not settled yet. Many actors are still reluctant, others have competing ideas or feel that they were left out. Furthermore, there are still two different supplementary scripts in use and far from all products bear the new label. The supplementary date label tries to balance two competing needs and issues. One the one hand it has to make sure food is safe and fresh enough to eat, on the other it adds a level of concern, a reminder about the senses and ultimately about its own fallacy. This article set out to present several issues surrounding the date label, making sense of its (re-)construction and inherent script and to unravel the processes of translation of goals into practice the date label (is hoped to) brings about. Only time will tell whether the messy process of re-scripting will lead to a better understanding and use of the date label.

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OPINION PIECE

Plan S, Open Access and the potential roles for STS research

By Elena Šimukovič

The year 2020 plays a highly symbolic role in the world of academic publishing. As the beginning of a new decade, it featured prominently in various research programmes such as "Horizon 2020", the framework programme for research and innovation of the European Commission, as well as in numerous roadmaps and development goals in various institutions across the globe. Yet, in the recent past, it has also become a target year in many strategic plans for shifting the business of academic publishing from the prevailing journal subscription model towards full and immediate Open Access.

The most prominent among them has arguably been "Plan S". It was launched in September 2018 by a group of national research funding organisations in Europe, including the Research Council of Norway (Forskningsrådet), the Dutch Research Council (NWO) and the Austrian Science Fund (FWF), among others. These funders collectively called themselves "cOAlition S" and announced an ambitious plan to require that scientific publications resulting from their grants be published only in compliant Open Access journals or on compliant Open Access platforms. The grantees of these funding agencies were said to face sanctions for non-compliance through enforcing contractual requirements of grant agreements as of 1st of January 2020 (cOAlition S, 2018).

Much of the controversy about Plan S that followed revolved around one particular issue: the decision to not support the "hybrid" model of publishing in which conventional subscription journals offer an option to ransom individual articles in Open Access for an additional fee (cOAlition S, 2018). This, in its turn, has caused a shockwave among the (potential) grantees. For instance, in an open letter authored mostly by scholars in chemistry and related fields, Plan S was seen as "a serious violation of academic freedom" that would rule out most esteemed academic journals and lead to "a surplus of papers of low quality/originality/newsworthiness" (Kamerlin et al., 2018, p. 2; see also Schneider, 2018). At the same time, other academics engaging in Open Access publishing have responded in support of the Plan S and attempted a rebuttal of "a number of highly problematic and logically fallacious statements" by their fellow researchers, in order "to address the problematic situation academia has maneuvered itself into with regards to scholarly publishing" (FOAA, 2018, p.1). After a public consultation process that lasted from November 2018 to February 2019 and collected more than 600 feedback statements, the timeline of the Plan S has been postponed by one year to 1st of January 2021 (cOAlition S, 2019).

While Plan S might sound as a "radical" plan (Else, 2018) to overhaul an outdated journal subscriptions system that stems from a print-based age, the idea of removing barriers to scholarly publications and transitioning to a new Open Access publishing era has been around for almost twenty years. At the turn of this millennium, the Budapest Open Access Initiative (BOAI)—which coined the term "Open Access" and laid the foundation for Open Access movement—declared as its goal "to make the transition from the present methods of dissemination [of scholarly literature] to open access" attainable (BOAI, 2002). The two implementation strategies that were proposed therein—the self-archiving of article manuscripts in electronic repositories, and a new generation of toll-free online journals—have later become known as the "Green" and "Gold" roads to Open Access. Along with the so-called "serial pricing crisis" in which academic libraries became unable to keep up their acquisition budgets with the rising journal subscription costs, these two models were put forward as complementary strategies to relieve them from financial constraints. Should the Green and Gold roads to Open Access gradually coalesce, as expected by the BOAI, journal subscriptions would ultimately become obsolete in the new academic publishing world (Guédon, 2001 and 2008).

During the early days of Open Access, there were clearly high expectations on increasingly widespread use of the Internet and Web technologies and their potential for building a digital "knowledge commons" (Guédon, 2001). This was coupled with a strong emphasis on the value of scientific knowledge as a global public good and the old tradition of scientists and scholars "to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge" (BOAI, 2002). Therefore, an alternative vision for the worldwide online availability of scientific literature was an intuitive response in light of the challenges and opportunities of the time. Restricting access to academic journals for the benefit of commercial publishing companies—even if most scientific publications resulted from publicly-funded research—was seen as at odds with the principles and opportunities for modern scholarship.

In 2012, to mark the tenth anniversary of the initial declaration, the BOAI reaffirmed its aspiration to remove access barriers to scholarly literature, but felt the need to add a spatial and temporal dimension to its goals: Open Access shall "become the default method for distributing new peer-reviewed research in every field and country" within the next ten years (BOAI, 2012). Motivated

largely by the public funding argument, this idea was taken up in a series of roadmaps and action plans by several major research organisations and their umbrella associations, such as Science Europe (2013), the Global Research Council (2013) and the European University Association (2016), to name just a few. Such efforts were further fuelled by an influential white paper published by the Max Planck Digital Library, claiming that "[t]here is currently already enough money in the system", thus, "[a] large-scale transformation from subscription to open access publishing is possible without added expense" (Schimmer et al., 2015, p. 7).

At the same time, numerous national transition plans were announced setting the pace and the target years by which a given country was supposed to reach "100% Open Access" of their share of scientific publications. This includes, for example, 80% by 2020 and 100% by 2025 for Austria, 80% by 2017 and 100% by 2022 for Denmark, or 60% in 2019 and 100% in 2024 for the Netherlands (see Bauer et al., 2015). The political momentum for Open Access in Europe loomed up at the latest in spring 2016. Along with the publication of the "Three Os"—"Open Innovation, Open Science, Open to the World"—by the then-Commissioner Moedas (European Commission, 2016), the Council of the European Union put "Open Access" and "Open Science" among its priorities under the Dutch Presidency in the first half-year of 2016. In its conclusions in May 2016, the Council agreed "to further promote the mainstreaming of open access to scientific publications by continuing to support a transition to immediate open access as the default by 2020" (Council of the European Union, 2016, p. 8). From now on, the colourful potpourri of national strategies and transition plans was supposed to be aligned with "a clear pan-European target" and to settle down at 100% in 2020 (The Netherlands EU Presidency, p. 30).

In summary, it can be said that Open Access initiatives have attracted increasing attention from academic communities and policymakers, while moving from the grassroots level to a mainstream topic on the science policy agenda. But the launch of the Plan S in September 2018 arguably mobilised the strongest responses both in favour and against it. Plan S was able to catapult Open Access into the centre of numerous debates over recent months and to lay bare the many issues in the current state of academic publishing. Most importantly, as the illustrative example of researchers resisting to publish their work in Open Access journals has shown, the publishing activity serves as a strong ordering force in academic life-worlds that goes beyond merely communicating research results from their work. It is intimately related not only with knowledge sharing among peer groups, but also with researchers' identity as members of scientific communities and the role that publication records play in research assessment rituals used for academic career progression.

In the long chain of events, however, Plan S can be contextualised as yet another iteration of the many attempts to bring about a revolution in the ways how scholarly work is communicated and evaluated. Moreover, as the early examples of Open Access advocacy show, the idea of a transition from the conventional "paywalled" subscription system towards a comprehensive toll-free availability of scholarly literature is not a novelty in itself. But the rapid accumulation of large-scale international and political initiatives in recent years calls for a careful examination of and attention to the underlying assumptions and repertoires of justification employed therein.

At this point, I would like to turn to the potential roles *yet* to be played by scholars and practitioners in Science and Technology Studies (STS) and related fields, for at least two reasons. Firstly, the battles in and about Open Access give rise to a number of new research questions about the current practices in and desired qualities for the future of scholarly communication and evaluation. For example, how is Open Access imagined, justified or contested by different actors and in which terms? What assumptions are built into the idea of "high quality" academic publishing that grant commercial entities an exclusive gatekeeping role as opposed to journals that are run voluntarily by academics themselves? While Plan S can be seen as primarily targeting big commercial publishers to change their business models, what implications may such initiatives have to other actors in the ecosystem of scholarly communication? Who is given voice, silenced or remains agnostic and under which circumstances? Why, if Open Access mandates were included in funding policies for a number of years already (cf. Kita et al., 2016), has the announcement of Plan S only now sparked such an emotional response? What particular problem-solution definitions and master narratives are mobilised and by whom? And, conversely, what is not being problematised? As a research community with a long tradition of studying the politics of knowledge production and dissemination, STS seems to be well-suited to tackle exactly such issues. At the same time, STS scholars have showed only limited interest in the study of Open Access controversies as a research topic in its own right. Some notable exceptions include examination of the origins of Open Access in relation to scientific ethos (Strasser & Edwards, 2015), the problems associated with the transition to electronic publishing (Elvebakk, 2010), commodification in academic knowledge distribution (Nentwich, 2001) or particular issues related to the future of the academic book (Hagner, 2015). Lately, aspects of "openness" in scholarly communication and science policymaking have gained more prominence and were at the centre of several ongoing or recently completed doctoral dissertations (see e.g. Lawson, 2018; Moore, 2019; Knöchelmann, 2020) as well as special journal issues (O'Neil & Collins, 2018).[1]

1 Questions on transformations and tensions in academic publishing and Open Science will also be discussed in several accepted panels at the upcoming conference of EASST+4S in Prague in August 2020.

Secondly, as a community of scholars that has established several well-known academic journals to communicate its own research results, STS researchers might also face tough questions on how to position themselves and own publishing choices vis-à-vis Open Access. The not too distant field of scientometrics has already witnessed a high-profile case with the collective resignation of the editorial board of the *Journal of Informetrics* (JOI) and the launch of the *Quantitative Science Studies* (QSS) in early 2019. As the editors of this newly "flipped" journal write in its first issue:

> The flip from JOI to QSS is neither the first nor the last of its kind. There is a tremendous Zeitgeist towards openness as the scientific community reasserts its role in the responsible governance of the scientific record. We welcome discussion with other editorial boards and professional societies as they grapple with these transformations. (Waltman et al. 2020:3)

Whether choosing to rearrange the relationship with their (former) publishers or not, those with the "skin in the game" themselves—i.e. the readers, authors, peer reviewers and particularly the editors of STS journals—might have to confront similar issues and (self-)critical inquiries at some future point in time. As a researcher-practitioner myself, I believe that these questions will require both, a thorough understanding of the complexities and intricacies of various (Open Access) publishing models as well as a broader discussion on (self-) governance in science and lessons learned from earlier science-society debates. Combining knowledges and experiences from these realms, thus, presents a strong case for interdisciplinarity.[2] Finally, making use of STS' own toolbox and asking *"How could it be otherwise?"* also in regards to academic publishing might bring forward a plethora of choices and possible alternatives, as the example of the open-access *Nordic Journal of Science and Technology Studies (NJSTS)* can show.

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BOOK REVIEW

The Platform Society

José van Dijck, Thomas Poell & Martijn de Waal, 2018.

Reviewed by Tor Anders Bye

The Platform Society sets out to understand the role that many of the new digital platforms of our time have come to play in public life and societal organization, and how they have altered (or attempted to alter) social practices and institutions within the countries in which they operate. In the book's introductory paragraph, the authors – José van Dijck, Thomas Poell and Martijn de Waal – point to terms like "the sharing economy", "the platform revolution", and "the gig economy" as attempts to describe the social change that have taken place over the past three decades alongside the transformation of the internet. It is an explicit ambition of the book to examine what role online platforms play in the organization of public values in both American and western European societies, as well as the issue of how public values can be forced upon the ecosystem that these platforms make up between them.

The authors formulate two overarching questions in the first chapter that serve as an outline on how to pursue their ambition; The main question driving their research is: *"What role do online platforms play in the organization of public values in American and European societies?"* In addition, they ask the more urgent question: *"Who is or should be responsible and accountable for governing a fair and democratic platform society?"* The book is divided into seven chapters, of which the first two attempt to outline the premise for their research and elaborate on the theoretical devices which they bring into this work, the next four explores a number of cases tied to four prominent domains of society (major *News* organizations, *Urban Transport, Healthcare and Health Research* in the public and private sectors, and various levels of *Education*), while the final chapter summarize their findings while attempting to formulate how this new platform society ought to be governed in a responsible fashion based on their research findings.

The overarching diagnostic provided by this book is both timely and necessary, given the longstanding complacency on the part of both the public and governing institutions to intercept the foothold that a number of the largest digital platforms have gained in the everyday lives of most citizens and consumers. In particular, chapter five examining the protection and circulation of medical data through so-called public-private partnerships should be of great interest to anyone concerned with the ability that major digital platforms and tech companies have in safeguarding sensitive information about their users, as well as refraining from compromising this data in pursuit of enterprises allegedly championing the common good alongside for-profit motifs. The chapter opens with an account of the proposed partnership between a hospital tied to the British National Health Service (NHS) and Google's DeepMind project. Through this partnership, Google would be granted access to *all* NHS data of 1.6 million patients, encompassing both historical patient information as well as sensitive details tied to abortion, drug overdose, HIV status and pathology records.

While Google's DeepMind project did spark great controversy at its inception, they are far from alone in their attempt to challenge the established sociolegal order in various fields. With a burgeoning field of online health platforms ranging from personal fitness apps to health-and-sickness apps emerging, the global industry of health-related platforms is being stacked onto and interwoven with the infrastructural core of the platform ecosystem while an increasing number of public-private alliances become forged in lieu of chronic underfunding and dire need of resources. Grounding their analysis in digital platforms illustrative of this sectoral trend – 23andMe, PatientsLikeMe, and Parkinson mPower – van Dijck, Poell and de Waal argue that legislators worldwide need "to understand how healthcare and health research are increasingly governed *by* platform mechanisms that unsettle many current legal premises and undermine established paradigms" (p. 115-116), referencing the disruptive impact that digitization of personal health information and services have had in a number of western European countries in later years (the implementation of New Public Management in the health sector being at the forefront of this development). The health sector is, however, not the only one to be impacted by the coordinated implementation of web-based solutions across all sectors of western society, and a number of other sectors face similar discerning altercations as a result of digital platforms becoming ubiquitous in public life on a global scale.

At the forefront of this development are the five largest tech-companies in the world, also known as the "Big Five" (Amazon, Apple, Facebook, Google and Microsoft). Given their critical role in our way of (re)organizing public life in a number of ways as part of the digital transformation to which modern society has

become subjected, it is well worth pausing to question the how's and why's of the Big Five's way to global dominion by way of superimposing their products and services on what is perhaps the largest and most diverse audience in human history: millions of individuals now purchase and sell physical products through Amazon.com or actively use the streaming service Amazon Prime, use Facebook to manage their social relations and organize their daily schedules (or even play games provided by third-party developers), and use the google search engine in almost every context (with the term "googling" having become ubiquitous). Most people also own one or multiple digital devices, provided either by Apple or Microsoft ranging from office-packages and software development tools to music- and video-streaming services. A number of other major platforms, such as Instagram, Youtube and Spotify have been consolidated by and incorporated into the vast number of products and services owned by at least one of these companies, in addition to China's so-called BAT-triumvirate (Baidu, Alibaba, and Tencent).

In order to accommodate the original ambition of their book, van Dijck, Poell and de Waal draw on several case-studies of individual Apps and digital platforms anchored in concrete events and developments from all over the world within the past few years in order to create a taxonomy that identify how platforms work in specific contexts. It is their argument that a "functional taxonomy of platforms could be useful to help guide legislators in updating their regulatory frameworks," in addition to "help politicians and governments decide what responsibilities tech companies carry vis-à-vis their online services and products" (p. 19). As their contribution towards such a taxonomy, they explore the intricate methods through which platforms organize their content, namely *platform mechanisms*. Based on their observations, they argue that these mechanisms are articulated through three distinct processes that they have labelled "datafication", "commodification", and "selection". Datafication refers to how platforms tend to quantify many aspects of the world that have never been quantified before, commodification the process in which objects (both online and offline), activities, emotions and ideas are transformed into tradable commodities, and selection the way in which platforms steer user interaction through the selection (or curation) of content most relevant to them through moderation.

Albeit a rudimentary outline of the taxonomy proposed by the authors themselves, it does succeed in identifying some of the large-scale concerns that circumvent users on an individual level by turning to specific examples on how various societal sectors are being influenced by the Big Five tech companies (and the vast subset of digital platforms owned by these). For instance, at the start of chapter three, van Dijck, Poell and de Waal explore the events surrounding the Cambridge Analytica incident, in which Facebook were faced with allegations that their "trending" news section and lacking human editorial oversight in redistributing News content contributed to the outcome of the American presidential election of 2016. Major platform developers like Facebook platforms are given more or less free reign as to how they structure their own digital platform(s) and on which terms their end users may come to enjoy them. Perhaps most notably in the case of News distribution, a wide variety of actors involved in both the production, circulation, and monetization of news content online have no choice but to use Facebook in order to interact with one another: thanks to Facebook's hegemonic status in content distribution, major news organizations are forced to develop new native and networked monetization strategies and organize the production and distribution of news content around platform data that outlines the metrics for its end users.

The authors' contention that digital platforms like Facebook and Google have gone too long without a modicum of public scrutiny is one that helps elevate the book towards a higher agency by arguing how companies like the Big Five may be forced to contribute towards maintaining public values in the societal sectors their platforms provide both products and services to, on both the local and national level. However, values such as *safety*, *privacy*, *transparency* and *accuracy* do not sufficiently express themselves through their infrastructural expressions within and across digital platforms, and must therefore be actively and consistently addressed by public institutions and individual citizens or civic collectives concerned with protecting the common good. They also point to the fact that "the American platform ecosystem comes with a specific set of norms and values inscribed in its architecture" (p. 27), grounded in ideologically explicit values that often remain implicit under said platform's architecture meets resistance in sectors and markets outside the United States (including Europe, in matters such as free speech and the right to public expression).

Platform owners and designers may claim to support and contribute towards such values in the name of the common good: For instance, as Facebook's CEO Mark Zuckerberg formulates in his own manifesto: "In times like these, the most important thing we at Facebook can do is to develop the social infrastructure to give people the power to build a global community that works for all of us" (p. 29). And yet, Facebook – like many corporately owned and operated platforms – are governed by a professional organization riddled with internal paradoxes, as pointed out by van Dijck, Poell and de Waal: while platforms tend to appear both egalitarian, to be of public value, ideologically neutral and agnostic, as well as locally oriented, they are in fact hierarchical, almost entirely corporate, heavily ideological and political in their architecture, as well as heavily oriented towards the global level. They also appear to replace "top-down" and "big government" with "bottom-up" and "customer empowerment" but does so by means of a highly centralized structure which remains opaque to its users (p. 23). If left unchecked, these platforms may continue to superimpose their products and services – and thus the architectural ideologies and politics imbued within these – on various sectors in whom they do not necessarily share an interest in protecting on an individual level. In addition, they are rarely (if ever) subject to collective agreements that protect the best interest(s) of citizens, sufficiently ensure their users' access to their

own goods and services regardless of geographical location or life situation, and – perhaps most notably – these platforms remain largely exempt from local and intranational taxation policies that similar, competing service providers and legacy companies are forced to adhere to.

The authors' conclude that a connective world "requires a profound rethinking of the world's online ecosystems along with the political and legal infrastructures through which they acquire legitimacy" (p. 163). As a growing number of both public institutions and individual citizens and consumers utilize the products and services provided by one or more major tech-companies, private actors and third-party developers, both local, regional, and (even inter)national governing bodies become entitled to greater discretion with regards to how their judicial restrictions and sociolegal mandate have come to be compromised by the emergence of new digital platforms. To the end, the authors remain quite adamant that the continued expansion and cementation of this platform society is a development that should not go unaddressed, as is reflected at the end of the first chapter: "Platforms are too important to leave their regulation to self-labeled operators and users; civil society, citizens, and governments have big stakes in a fair, democratic, and responsible platform society" (p. 30).

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ABOUT THE COVER ARTIST

Setsuko Kurioka

By Martin Anfinsen

Setsuko Kurioka studied at the Trondheim Academy of Fine Art and later worked from Lademoen Kunstnerverksted. The artist is now based in Asker, near Oslo, where she has her studio. Currently, Kurioka works on a grant from Arts Council Norway, and her pieces has been featured multiple times in the annual Autumn Exhibit. Her work has also recently been acquired by the National Museum of Decorative Arts.

Throughout her artistic career, Kurioka has explored drawing, sculpture and needlework. The piece used for this issue's front cover is a part of Kurioka's series "Needlework I: Simple Frameworks by Needle". Inspired by the kimono sewing techniques of her native Japan, the series explores abstract, geographical shapes and patterns using paper, needle and black cotton thread (the artist has previously described the use of silk as snobby). Here, the needle pierces the paper precisely, moving in a straight line, while leaving behind a pristine, soft trace of black cotton.

Kurioka describes how she found inspiration for this work in the night sky—where she imagined drawing invisible threads between bright stars. This fantasy grew, and later manifested in the series "Needlework".

For the editors of NJSTS, the series has echoes of the pure aesthetics of text on a page, books on a shelf, and the beauty inherent in order—a perfect accompaniment to a scientific journal, in our minds.

To learn more about Setsuko Kurioka and her work, visit her website at https://www.setsukokurioka.no. Parts of the "Needlework" series will also be shown in a separate exhibit at the gallery Kunstnerforbundet in Oslo, February 2021.