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Actionable and reliable? Managers' and journalists' views on the validity of newsroom metrics to guide journalistic work

Note to the reader: This is part of my empirical findings for my dissertation project titled: *New(s) Metric Management - Journalists and managers at work in Sweden's data-informed legacy newsrooms.*

I have just passed my 90 percent seminar, and have been encouraged to restructure the findings thematically instead of based on my empirical sources (managers and journalists). The themes were grouped into 1) the construction of measurement as such, their intended purpose and if they are perceived as reliable, significant and valid, 2) the implementation and negotiation of newsroom in the workplace, 3) the justifications and criticisms of newsroom metrics on organisational and occupational aspects of journalism.

This conference paper is the first effort to restructure (part of) the first strand of these findings, namely how two group of institutional actors (senior key managers and journalists) in news organisations perceive and negotiate the claims of capturing knowledge about a "messy world" through data turned into newsroom metrics.

To help the reader, I include some notes on definitions, empirical data, and theory in this document.

Definitions

Newsroom metrics: While the use of digital data in news organisations has been referred to in various, partly overlapping ways (digital/internet/web metrics, web statistics, data-driven news cultures, algorithmic news practices, et cetera) I introduce and use the term newsroom metrics for my research topic, Newsroom metrics are defined as the metrics that are made visible to journalists in the workplace with the purpose to influence and guide their work. In comparison to audience metrics (Ahva & Ovaska, 2023; Belair-Gagnon et al., 2020; Kristensen, 2021; Zamith et al., 2020), the aim is to highlight that newsroom metrics are not solely derived from the audience but also the production, and that audience metrics are often analysed in combination with production data. Furthermore, the term newsroom metrics underscores the focus on their strategic use to manage the work taking place in newsrooms, and not for example, to learn more about the audience per se.

<u>Data-informed newsrooms:</u> The notion of data-informed newsrooms (e.g., Hendrickx et al., 2021), as opposed to data-driven or data-led (Ekström et al., 2022), derives from newsroom discourse but implies tension between technology, business and editorial concerns even as organisations increasingly rely on data. As pointed out by Ahva and colleagues (2024), when news media managers seek to manage newsrooms supported by data, but not driven by data, negotiations and sense-making will be an ongoing area of tension.

A short note on the empirical data

The study is set in the increasingly datafied Swedish legacy newsrooms (i.e., organisations with a print and broadcasting tradition) and encompasses all major private and public news organisations in Sweden.

I have two sources of empirical data. The first source is individual interviews with senior key managers (n=19) whose work tasks include newsroom metrics, for example head of editorial development, head of editorial analytics, directors of digital departments and so on. The second source is focus group interviews with journalists (n=26) from the same or collaborating media groups who were also elected union representatives and, as such, expected to have a better overview of any conflicts or tensions caused by newsroom metrics.

Unlike other organisational studies in the interpretive tradition, which usually consist of detailed case studies of a few or a single organisation, the aim here is to try to uncover a more general shift within the news media industry as an institutional field, that is, attitudes and practices of newsroom metrics and how this in turn relates to institutional values. These elements are particularly important in media organisations, where people are often motivated by the 'higher order' (Küng, 2008).

A short note on the theoretical background

Practices of measurement and quantification are not new but have been intensified by digital datafication into a broader societal trend (Mau, 2019; Mayer-Schönberger & Cukier, 2017). Quantifying aspects of news production and distribution involves the same steps as any quantification process. That is, converting perceptions of a messy reality into categories (ratio) and then creating measurement methods that give a value (quanta) (Bornemark 2019). Both categorisation processes, measurement methods and results can be discussed and questioned by stakeholders.

Much of the power of metrics, and the power struggle surrounding metrics, derive from metrics' promise of providing factual knowledge about the reality and concrete evaluations of

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performances. Still, the ability of measurement to capture a complex reality is regularly contested, and metrics, ratings, and rankings can be (and are repeatedly) criticised for their limitations (Beer, 2016; Espeland & Stevens, 2008; Grosser, 2014; Pollitt, 2018). Yet, the power of measurement seems unaffected by such questionings, and quantification is described as a self-reinforcing logic amplifying "rationalization in contemporary society." (Chun & Sauder, 2021, p. 335). Moreover, numerical information is often perceived as concrete, neutral and objective. This is why actors habitually turn to metrics when they emphasise transparency, accountability and evidence-based evaluation, for example, in public administration (Borell, 2021; Mau, 2019).

Esposito and Stark (2019) argue that the same features that warrant criticism – metrics and rankings are simple, opaque, subjective, and fail to predict the future – also explain why metrics are so effective: They are simple, but if we knew more about them, we would also be able to question and resist them more. We find metrics useful since they hold the promise of increasing our knowledge and understanding of this world, and we expect metrics to function as guidelines in our lives. Differentiated data also makes it possible to compare and compete. As Esposito and Stark (2019, p. 134) put it, "Numbers unite and separate: each object expressed in numerical form is comparable to any other, but it is also different (bigger or smaller) from any other object." Still, Esposito and Stark (2019) conclude that metrics work poorly as a means to eliminate anxiety. Instead, anxiety increases with ratings and rankings. Beer (2016, p. 210) finds metrics to "manufacture uncertainty" and thereby drive us towards self-training, self-government and even a self-entrepreneurialism of sorts.

Still, a fundamental aspect of metrics' ability to gain power is their epistemic character, that they are perceived as a tool that provides knowledge. In this section, I will analyse how managers and journalists reason around the knowledge claims of newsroom metrics to get information on audience preferences to improve organisational performances.

When Cherubini and Nielsen (2016) reported on the evolving practices of metrics and editorial analytics in leading news organisations, they painted a picture of more mature measurement practices tailored to organisational priorities compared to the initial rudimentary metrics (mostly a concern for a marginal web editorial team) and the later generic metrics, that had a narrow, short-term focus. The Swedish managers expressed a similar narrative. They were not at the forefront in 2016, but since then, they have invested heavily in developing more advanced measurement practices (Lindén et al., 2022; Lithner, 2019).

Constructing newsroom metrics – actionable, reliable and valid?

The increased impact of metrics in news organisations was understood by both managers and journalists as a consequence of new technology and economic pressure. Online publishing had led to increased competition and changing audience behaviour: "And of course you have to be able to track, understand and *act* on that" (head of editorial development at DN, my italics). This emphasised that metrics aim to influence newsrooms to move in a particular direction.

> Setting targets and achieving them are important parts, that the data doesn't just pop up and 'alright there we had 412 page views, let's make a new article'. Instead, you have an idea, we're here, we want to go there - so, we're taking a series of actions to get us there, and are we succeeding or not? And the outcome is how well you manage your business, how well you succeed in meeting the needs of your readers. (NTM)

The strategic purpose of measurement is also evident through the wording. Managers and journalists in both private and public news organisations would regularly refer to newsroom metrics as Key Performance Indicators (KPIs). This accounting and management term explicitly link metrics to organisational objectives – as explained by one manager: "you have an idea of what you want to achieve and then you have numbers that measure how well you are achieving what you want to achieve. KPIs and metrics are no more difficult than that" (Bonnier).

Notably, audience data was mainly viewed as a resource for organisational actions and decision-making. However, compared with traditional evaluation processes, explained by the audit culture of public service or the single-copy business model of the evening papers, journalists pointed out the technology-driven fine-grained measurability of individual news stories as a more robust "call to action". This is evident in how one journalist described going from broadcasting to a newspaper website in 2014.

> At [the television channel], we did measure views to a certain extent, but we didn't feel we could influence them exactly ourselves in the way that you feel nowadays, that you can do with individual news stories. (BNL journalist).

The view that metrics can be influenced was an important prerequisite for journalists taking an interest in metrics. The quote above also illustrates how the emergence of newsroom metrics has been intertwined with the transition to digital technology. Journalists working at organisations with a later focus on online journalism, or with less developed practices of data analysis and targeting, self-described their news organisations as "outdated" or "relaxed" in the face of external pressure (technological change) to adapt. The more an organisation focused on digital publishing, the more the focus shifted to audience numbers, and the more this was felt by the

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individual journalist. Conversely, the longer an organisation focused on the previous form of publishing, the less measurement pressure the individual felt.

This explained why journalists sometimes found it difficult to separate the impact of measurement tools from the impact of digital publishing, where online formats and templates constrained journalists' choices. Changes occurred in an interconnected logic when, for example, SR management identified that short sound bites were more effective in engaging online audiences and thus generated higher metrics. Thus, in their role as union reps, public service journalists described conflicts over metrics and Key Performance Indicators (KPIs) often linked to wider negotiations over the introduction of new online formats and management strategies to target certain audiences.

> There are a lot of other things in this change that are not seen as reasonable by all. So, it's difficult to isolate the KPIs [as a source of conflict]. (SVT)

Journalists also linked the adaptation to metrics to the financial situation. The importance of digital measurement tools increased with the analysis "that print is dying", as expressed by an Expressen journalist. With more widespread staff cutbacks, newsroom metrics gained more power to influence editorial priorities.

> Several newspapers have abandoned evening shifts /…/ or if events take place on a Saturday, someone perhaps has to change their working hours – and that you only do if there is a story you have to do and/or if you know it will be widely read. (BNL journalist)

Journalists who were elected union representatives were regularly informed about organisational budget and economy, and in general, the private media journalists had accepted newsroom metrics as a way of strengthening the news organisation's ability to remain viable.

> We are all aware of the industry's financial situation, so there's no controversy around us measuring what we do to improve ourselves (Gota journalist).

However, trust in metrics is also a potential arena for negotiations, that is, the perceptions around the ability of measurement to accurately reflect reality, both in terms of the quality of the input data and its interpretation. Both managers and journalists used words like "receipts" and "answers" for the quantified outcomes and shared the view that online audience data produced "a kind of evidence that in our world you could only imagine before" (SR journalist). Still, managers and journalists acknowledged the effort to construct categories and numerical 'values' from their data, the elements of interpretation and ambiguity. The next sections aim to unpack these often partly contradictory discourses.

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Aspects on reliability and validity – segmented, behavioural, and proxies

The first step in generating reliable metrics is to ensure the quality of data input. Although the managers underlined the importance of reaching a younger audience and, consequently, the importance of following segmented audience data, they also acknowledged that such data was less accessible or reliable.

The media group NTM encouraged family members to create individual logins when they signed up for a family account. However, most news organisations were only left with the option to make informed assumptions and conduct behavioural pattern analyses using "the data that we have, so to speak" (Aftonbladet manager). Subscriber registers provided data on age and gender, but "people share a subscription account pretty freely" which led to skewed data, and through Google Analytics "we can segment by age and geography, but that's it" (head of editorial development at Gota). NTM's head of editorial analytics stated that both these data sources will come with errors and "a lot of times I'll pit them against each other when I'm not sure if I can really trust them."

To compare data sources was a common method to achieve a higher level of accuracy, but sometimes, news organisations had simply abandoned certain metrics because they were too uncertain. This was the case with SVT Local's previous metric 'direct local traffic' since "it may look like we have visitors from Hong Kong, but that's because they're bouncing off a server, so we have no way of measuring that [parameter]" (News director, SVT Local).

While not using logins or tracking individuals, SR still gained some access to segmented data through podcasts published on external platforms such as Spotify and Apple, that is, the type of data they had chosen not to collect themselves.

> When they publish our material, they know things about the audience: This podcast is listened to more by men than by women, it's listened to in the evening, and so on /…/ We don't know anything about the demographics in the way that they do. And we get that data from them as all podcasters do." (Head of SR Play).

Among public service managers, opinions on the matter of audience registration were mixed. Some expressed the importance of ensuring audiences have unobstructed access to content without the need for registration and that it is futile to measure only a portion of the audience. Conversely, others emphasised the potential of audience data to personalise content and enhance analysis. For instance, the interviewed SR local area manager noted that identifying the geographical location of listeners could provide better tools for assessing success in targeting local audiences, such as improving outreach to socially deprived areas.

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Several managers expressed that compared to previous survey data on audience preferences and consumption behaviours, the software captured actual audience behaviour and was thus a more reliable source of information. Managers also generally considered that behavioural data created a more valid base for understanding what kind of content created "audience value" and, for commercial media, long-term willingness to pay. The only example of a manager questioning (or nuancing) this assumption was when the SvD head of editorial development discussed the balance between user data and more psychological mechanisms, such as subscribers' expectations of buying into a comprehensive product: Theatre reviews may have a small readership, but readers could still expect them to be there, just in case they want to read them later.

> This is difficult to argue because it's hard to see, but there are driving forces that sometimes lie beyond what you click on. /…/ It's a feeling: 'I probably want everything; I want the biggest package'. There is such a type of person. But it's trickier, and you need to have some balance. (SvD)

As demonstrated, journalists who were elected union reps may view the intensification of measurement within news organisations as a justified adaptation to factors of technology and economy. The union reps did not really question that their organisations collected data and used measurement tools. However, they would question the tools' capability of providing reliable information. Such objections can be found in statements such as "Metrics will never capture why people click on something. There could be a thousand reasons why you start [a video]. We can never know" (local SVT journalist). Although organisations were working on developing their measurement tools, there will always be limitations, remarked a local newspaper reporter.

> I think what's always been the tricky thing about measurements is that you have always measured, or as long as I have worked, you have always measured, but you have never really been able to measure what you want to measure, so then you measure other things instead. You cannot measure why someone wants to subscribe to the newspaper, so you measure which things are read the most or what attracts the most sales. But then you don't know whether those who already were subscribers thought this was just as good, and so on. So, these are very blunt measures to deduce something like that (NTM journalist)

Since audience metrics capture behaviour, not the audience's perception of editorial quality, comments were that the evaluation process does not capture the newsroom's ability to produce content that the audience finds valuable. However, as pointed out by one of the national

newspaper journalists, it might not always be significant, as a reader of an ordinary news article may not think much about whether a text was well-written or not.

Still, journalists questioned the reliability of metrics based on the fact that it excluded consumption via printed newspapers and broadcasting or that the evidence base for statistics on young audiences (small newspapers may have very few younger subscribers) is very limited. Also, the conversion metric, a KPI that ranks the articles that have attracted new subscribers, was described as particularly blunt by smaller newspapers.

> Sometimes two articles from five years ago appeared on the list, because someone went online and thought: I want to read that article my mum was in before, and they started a subscription (NTM journalist)

While the interviewed managers recognised that metrics are constructed based on certain interpretations, they also shared a strong belief in the potential to develop and refine measurement practices to provide more accurate and valuable information, which resonated with the future-oriented view on metrics found by Ahva and colleagues (2024). Managers generally expressed a more positive and explorative attitude to developing and improving the design of metrics to guide and evaluate operations, even if not perfect. The senior assistant to Bonnier's CTO gave a rather detailed account of the use of proxy metrics – "something that can be measured, but it's not what you really want to measure".

> Say we want to measure engagement, well, we can't measure that, /.../ but we can measure page views per day. OK, well that might be good enough. Still, we are aware of what it represents and what we want to achieve by doing that. It's this story connection that I think is important.

By story connection, they meant that the organisation should start by formulating what they wanted to achieve – 'the story' – and then discuss what different metrics could represent in that story: For example, "To reach more people with more" could be measured as numbers of active days per user; "Being the number one subscription platform for news and feature journalism" as household coverage and number of subscribers, and "Creating a lifetime relationship" as how much money an average user will generate over time.

While the examples above are all about organisational growth, organisational objectives such as SVT's diversity of perspectives initiated similar discussions:

> So, how can we measure having multiple perspectives? We can test it out, ask questions in focus groups and have a KPI for success. /.../ It's clearly more complex, advanced and time-consuming to get answers to these types of questions, but /.../ it's exciting and

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gets people involved in a way that just talking about 'This is how many unique visitors this article has' wouldn't. (Digital programme director, SVT)

Turning editorial values into numerical values

Aside from audience reach metrics, news organisations also designed metrics linked to journalistic duties and ideals. Examples included monitoring geographical coverage and gender representation, as well as value-based categories like 'constructive news', 'original reporting', and 'public service value'. Below is a quote from SVT Local, illustrating the strategic development of measurable meta-categories to influence editorial decision-making.

> In my line management role as programme director for local news, I have set some targets with my management team in our objectives document. We said that a third of local content should be considered "original news" according to a particular definition that we came up with. And that's because when I came here, I thought that /.../ we were simply contributing too little to the media ecosystem. (SVT)

Another example was SVT's 'multiple perspectives' mentioned in the previous section. As SVT and SR are tax-funded, some KPIs may be seen as part of the public administration 'audit culture' (Power, 1997). Metrics can monitor regulatory compliance, organisational efficiency, and editorial standards. Public service managers distinguished KPIs from three different remits: company board/CEO (e.g., local presence), production management (e.g., reach and completion rates), and line management (e.g., original news). The head of SR Play stated that metrics such as local presence were important for the organisation but less useful for innovative purposes.

> I think very little about that kind of measurement, which is more at the company level, based on our broadcasting licence. /.../ At a higher level, it is important. I mean, for example, if one of our local radio stations stops visiting the different municipalities, that's going to show up in the statistics, so it's a way of drawing attention to it, but it's also a way of showing that we're doing our job. /.../ But it's still a bit removed from the more development-oriented, fine-grained data. (SR)

Maintaining detailed news content statistics has a long tradition in public service broadcasting, predating digitisation. However, Rolandsson and colleagues (2022) have shown that digital publishing introduced additional categorisation and consequences: SR defined a specific 'SR value' for algorithmically sorted online news playlists. Evaluating content tagged with 'SR value' (e.g., 'lifting marginalised voices', 'audible presence') audits editorial standards, similar to pre-digital statistics on interviewee demographics. However, it likely exerts a more immediate controlling impact on the newswork, as meeting the 'SR value' affects publication visibility. Thus,

online publishing may enhance the influence of value-based metrics, especially when linked to audience metrics.

To some extent, metrics-monitored prioritisation was also evaluated through audience metrics, which was also illustrated by the following SVT manager quote:

> They also say that since we started doing more original news, the local material is also performing a little better. So, I still think that the data supports our movement, even if it takes time. (Programme director, SVT Local news)

As SR also caters for minority and niche audiences, the head of SR Play also felt inspired by the concept of signum metrics, which they came across on a study visit to *The Guardian*, and felt it made sense to focus on tracking and improving the presentation of the narrower material that the editorial team sees as its signum, rather than the "material that sells itself" (SR Play).

While public service media had several metrics connected to organisational values and occupational legitimacy, commercial media had, in principle, only one: gender balance. Although stated as an important KPI by interviewees in the private media, these measurements were not intended for public dissemination to enhance the media organisation's legitimacy (more important for public media), nor does it seem like the editorial management strongly enforces the 50/50 target. One reason is perhaps that these tools often came with some evident data flaws but also risked leading to unwanted consequences (e.g., no images when presenting the male football team) if journalists adopted their practices in a short-term view.

Journalists believed that in some areas, the question of metrics' quality was more important to discuss and question because of their potentially detrimental influence on editorial decisions. For example, targeting high numbers implicitly encouraged local newsrooms to produce more general or nationally relevant news, as expressed by a reporter at a local SVT newsroom.

> On the one hand, we should be aiming for a lot of clicks, and the easiest way to do that is to end up on the national news page. On the other hand, you could argue, who is our audience? Well, it's the local people. And a lot of our audience is older and haven't even found our news app. /…/ And that begs the question: who are the recipients for the journalism we do? And is this what we want? (Local SVT journalist)

One reporter at a local subscribed newspaper tried to raise a similar issue when the majority of readers came from other parts of the region.

Speaker 1: I can see where the reads are coming from on a map. /…/ All the managers were really pleased with the 6,000 views on that story. But, those of us who cover the local area might not have thought it was so good.

Interviewer: So how advanced is the analysis done by the management?

Speaker 1: Not very advanced, I would say.

Another shortcoming underlined by journalists was the inability to capture subscriber retention, mechanisms impossible to reduce to "an Excel sheet, you have to find other ways of analysing it".

We have a lot of figures on articles, which leads people to start a subscription. It's a lot of live sports, for us anyway. But then, when we look at the overall figure at the end of the month, there are about the same number of subscribers. So, what is it that makes people stay? Obviously, as many have dropped out as have signed up. /.../ What material do people value enough to keep paying for month after month?

The inability of the measurement tool to provide information on how to avoid a net zero change also allowed journalists to make their own interpretations.

I personally believe that the answer is journalistic quality, that people perceive the newspaper to be credible, all these factors that create quality journalism – that you have to invest in [quality journalism] to retain people over time. That is the analysis I would like our management to do. (BNL)

When journalists questioned the validity of measurement tools, this often implies negotiations of journalistic ideals: What it is to perform well? What goals should the news organisation strive for? The criticism is that measurement tools will provide a reduced, and sometimes misleading, representation of the values against which the organisation seeks to measure itself. This is evident in the discussions of providing content that matters to a local community and not the larger audience, or, content that audiences find qualitative and credible. These aspects of the production and reception were recognized as more difficult to evaluate in numbers, and thus facing the risk of getting less attention. However, journalists also questioned the validity of numbers for the strategic purpose of organisational survival, as in the example of subscriber retention.

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Changing objectives, changing KPIs

As implied by the meaning of the abbreviation KPIs, management aimed to distinguish the (measurable) performances that are key for reaching the most important organisational objectives. This also means that when news organisations change their views on goals and key performances, this should also influence their measurement practices.

One example is when newspapers turned their hope to online subscribers instead of online advertisers, they consequently switched their focus from page views to conversion metrics. Another example is when SR decided to prioritise audio in their online publishing and abandoned Chartbeat.

> It's obvious that things change when those metrics disappear, that we're saying that the interesting thing isn't the page views of articles per se, but how many people started the audio. I'd say this is a milestone that perhaps not many of our co-workers would be able to point to – but for us as a company, I think it mattered a lot. (SR play)

The choice of metrics could also depend on organisational stages: When SVT expanded from 15 to 21 local newsrooms in 2015, they focused on unique browsers to monitor the growth of these new local "brands", as explained by SVT Local's online manager.

> But at some point, the question becomes how much more you can grow, and then the visits start getting more interesting. So, we might have hit a plateau with unique browsers, but on the flip side, those who've found us are coming back more often, checking out more articles and videos, and watching more videos. (SVT Local)

In other words, there was also an inclination towards replacing metrics when they no longer moved (preferably upwards).

The importance of aligning editorial metrics to overarching organisational objectives was manifested through the importance attached to collaboration across departments and through the incorporation of 'KPIs'. Creating value-based meta-categories (i.e., in addition to factual categories like news topics or locations) allowed management to use control and evaluate the production from a specific perspective.

Journalists are also well aware that metrics are constructed: As one journalist puts it, "everything is there, the question is what you take out and care about". Changes in organisational strategies are reflected in the editorial metrics that management prioritises, and these priorities can change quite quickly.

> Suddenly we're going to put fewer articles behind the paywall because we need to bring in more advertising money. /…/ A few months ago, the priority was to measure what

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logged-in subscribers were reading. So, then one reacts a bit: How did you get there? Quick changes. We're focused on one thing, and then we suddenly shift. (Local journalist)

But the same journalist also believed that the union members generally trusted how the organisation employed and explored measurement tools.

When changes are explained to you, why and how, I think most people still, well, maybe they don't like everything, but they somehow buy into it /.../ that they are really being used for our benefit, for newspapers to make the right decisions. Then it's not always the right decision, but then you try to reverse it…

Still, this is not the only time journalists described organisational strategies as managers "sticking their finger in the wind" or trying out a new trend. In other words, the organisation's evaluation processes are not always described as based on real expertise, but rather on guesswork. Experiences of rapid shifts undoubtedly contributed to these views. However, the most dismissive criticism is often directed towards KPIs no longer in use; one example was the "reading value".

They tracked how many people had read the article and how long they spent reading it. This resulted in an overall value of the article, which could even be negative. So, you could get a figure in the morning: The article you published yesterday had a reading value of -32. This could be interpreted as it would have been better if it hadn't been written at all. (BNL journalist)

After one of the focus group interviews, one of the journalists turned to a colleague and said jokingly, "So, you had 1,000 conversions, but it doesn't matter because we're measuring something else now." The comment shows that the recognition of performance is affected when the measurement tool changes. However, journalists also described a concrete impact on editorial priorities. For example, the shift from general page views to subscriber page views is typically thought to cause an allocation of resources from breaking news to in-depth and investigative reporting.

However, there were also examples where journalists described the organisational KPIs as established and stable. Several journalists also expressed that KPIs had become more complex and their use more nuanced over time, perceptions that may of course also be due to a more general normalisation process.

Among managers, there were conflicting views too between the professional pursuit of better and better measurement tools and the question of whether it is always so important what you measure. When organisations analysed the correlation between different ways of measuring

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audience preferences, the tendency was often quite similar as to what content 'performed well'. Different measures yielded different figures (e.g., page views exceeded read-through rates), but the significance may be negligible.

While the head of BNL business area believed in employing metrics to better reach the younger age group and that the metrics would become even more advanced with time, they still did not believe that "some super new exciting metric" would come and rescue the news industry:

> We know, well, actually we know exactly what we need to do. So that... the difficult thing is rather to make it happen, it's more of an organisational leadership challenge, like a challenge against, you know, human behaviour (BNL manager).

At all levels, managers also emphasised the importance of looking at a combination of metrics, that there is no "one metric to rule them all" (Bonnier). The interviewed NTM editor-in-chief did not have to look far back to realise that even the focus on conversion turned into something of a "quest for the Holy grail".

> You tried to find some kind of magic formula like, 'if I write this article and do this' … but there's no such thing. You can't just go to a reporter and say: Go out and do a conversion please. There's so much analysis that needs to be done to understand the big picture of what affects a conversion or an engagement. The metrics we look at are based on the fact that we want to create engagement, long-term engagement, with our readers and that they return to our sites and that they read for a long time and consume more. Then we get the conversion in the end. But that's not where we start. ((NTM)

One strategy for incorporating more complex analysis is to construct composite index measures, such as DN's organisationally tailored 'total engagement', SvD's 'readership score', and GP's 'engagement'. Composite metrics also meant that management aimed to balance and weigh different parameters against each other to steer the focus.

> The idea is really that if you only measure time spent, it becomes an indirect incentive for people to write long. And if you only measure completion, it becomes an indirect incentive for people to write short. /…/ But if you work with the two as a counterpoint, you can get to a sweet spot of discussing dramaturgy and how to add depth without getting boring and so on. (Head of editorial analytics at GP)

The analysis team at GP was confident in the validity of the engagement metric and believed that integrating several important parameters into a single metric would be a way of making the analysis easier for journalists to understand. However, the abstract nature of index metrics appeared to hinder their impact on news work. The GP manager concluded that the index

metrics faced too much of a pedagogical challenge since both editors and journalists seemed to find page views more familiar and easy to understand and continued to focus on them.

Final remarks

In comparison with studies on pre-digital media organisations, the industry's objective to turn audience data into "a kind of knowledge that allows them to act, not paralyze them" (Ang, 1991, p. 51) is not new. This is also consistent with how Mayer-Schönberger & Cukier (2013, p. 78) described big data as intensifying, but also continuing "humankind's ancient quest to measure, record and analyze the world". Nevertheless, there are important differences between how previous and current systems capture data in terms of speed and detail, and not least, there is an organisational change in terms of access and visibility: While the media industry has utilised various measurement tools since its inception, these have been primarily developed and used by specialists and managers, while journalists were insulated from audience data and expected to disregard such influence (Bjur & Bolin, 2014). With the introduction of new technological tools, data has become "where the synthesis of journalism, technology, and commerce is most evident" (Küng, 2017, p. 26). With data turned into newsroom metrics, this pressure of technology and economy is also felt in the daily practices of journalists.

Both managers and journalists were aware that the information conveyed by newsroom metrics were limited and interpreted, that metrics would never convey all the nuances of a complex world, However, this does not automatically hinder metrics from being used and perceived as rather precise "receipts" and "answers". To compensate for given, flawed, or one-sided data, the proposed management strategy was to focus on aggregated patterns over time and to compare and use several metrics in the analysis. This relates both to how Espeland and Stevens (2008) have discussed the coordination efforts and work that quantification requires, as well as the polyvalent authority of quantification, but also their power to focus social behaviours. But in comparison to more general reactivity mechanisms of rankings (Espeland & Sauder, 2007), the example of the engagement index metric also showed that newsroom metrics also derive their legitimacy from journalists perceiving them as an expression of the audience's will (Christin, 2020): metrics can only be abstracted from the audience to a certain extent to become a powerful influence on the editorial teams.

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